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USSR Report

AGRICULTURE

No. 1278

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MAJOR CROP PROGRESS AND WEATHER REPORTING

STATUS OF SPRING SOWING CAMPAIGN IN UZBEK SSR

Moscow SEL'SKAYA ZHIZN' in Russian 2 Apr 81 p 1

[Article by A. Uzilevskiy, Uzbek SSR]

[Excerpts] Spring arrived early in Central Asia this year. However, the March rainfall was not as plentiful as in past years. In order to compensate for the shortage of moisture, the farms carried out water supply irrigation work out on the fields. The leaching of the soil was conducted ahead of last year's schedules. In those areas where the soil was considerably saline, the leaching work was carried out two or three times. The work of cleaning out and repairing the interenterprise and intrafarm collectors and irrigators has been completed. The equipment has been placed in working condition.

The period of warm weather which set in only recently has accelerated the ripening of the soil. The time is at hand for sowing the cotton.

Taking advantage of the full capabilities of their equipment and working in two shifts, hundreds of brigades on farms in Surkhandar'inskaya Oblast carried out their cotton sowing work in record breaking times. The seedlings have already made an appearance out on the fields. More than 1,500 sowing units are in operation at kolkhozes and sovkhozes throughout the oblast, as units of mechanized detachments. Each day they sow 10-12 percent of the area allocated for cotton and in just several days the sowing plan will have been completed. This is especially important in view of the fact that Surkhandar'inskaya Oblast accounts for 60 percent of the republic's production of fine-fibred varieties of cotton.

The tempo of the sowing campaign in Kashkadar'inskaya and Bukharskaya Oblasts and in the regions of the Fergana Valley is increasing.

Hundreds of precision drills have been moved out onto the fields in Namanganskaya Oblast. Here the expenditure of bare seed per hectare is only one half the usual rate.

Nor was it an accident that one half million hectares of irrigable arable land were allocated for precision sowing throughout the republic. Experience has shown that the crop ripens 1 week earlier on this area and thus it can be harvested earlier -- during the most favorable warm and dry period in autumn. Thus the quality of the cotton will be higher and losses can be avoided. Unfortunately, the republic's Ministry of the Cotton Cleaning Industry is still not fully coping with its plan for preparing bare seed and shipping it to the farms.

This year, for the very first time, the kolkhozes and sovkhozes are sowing cotton on 400,000 hectares of harvested ridges. This effective agrotechnical measure, as experience has shown, is making it possible to weaken the effect of post-sowing rainfall on the formation of soil crust. The water rolls down the ridges into deep furrows and is released into the land reclamation network.

At the present time, roughly one third of all of the cotton areas are being sown with mulching of the soil in the drill rows. And this method is promoting healthy germination of the seed and seedling development. Many farms have laid away mulching materials and have been using it extensively since the commencement of the sowing work.

This year the sowing of cotton is being carried out simultaneously with a herbicide application on 80 percent of the sown areas and with a simultaneous application of fertilizer -- on all of the fields. Biostimuli are being employed extensively in carrying out the sowing work.

In all, 3,500 complex detachments will be employed for carrying out the sowing operations throughout the republic. They include 36,000 sowing units and 11,000 items of various types of equipment for providing technical servicing. For double-shift operations, these detachments are staffed with 166,000 machine operators.

Inspired by the decisions handed down during the 26th CPSU Congress, the farmers of Uzbekistan are striving to do everything possible to celebrate the first year of the Eleventh Five-Year Plan with new accomplishments out on the cotton fields.

7026
CSO: 1824/218

MAJOR CROP PROGRESS AND WEATHER REPORTING

OVERVIEW OF SPRING FIELD WORK IN UKRIANIAN SSR

Moscow IZVESTIYA in Russian 8 Apr 81 p 2

[Article by A. Dolenko, Ukrainian SSR: "Every Hour Is Important Out On the Spring Fields"]

[Text] One week ago the spring crops had been sown in the Ukraine only on farms in the Crimea and Trans-Carpathian regions and in the Azov and Black Sea zones and yet today the sowing units are already being operated in full force on fields in the northern oblasts -- Kiyevskaya, Zhitomirskaya, Chernigovskaya... Spring field work has unfolded in practically all areas throughout the republic: the winter grain crops are being tended and many hundreds of thousands of hectares have been sown in spring crops.

One wonderful feature of this present spring period is the fact that the rural workers are devoting greater attention to the zealous and efficient use of the growing production base and all resources made available. In response to the decree of the CC CPSU, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee, a socialist competition for the successful fulfillment and overfulfillment of the tasks for the Eleventh Five-Year Plan and for reducing the period required for carrying out the field work has been launched with new force among the labor collectives.

In order to carry out the increasing tasks with regard to the sale of grain to the state and also for the purpose of satisfying the animal husbandry requirements for forage, the average annual gross yields of grain in the republic must be raised, commencing this year, to 51-52 million tons -- that is, an increase of 8-9 million tons compared to the average annual yield for the Tenth Five-Year Plan. Reserves are available on each farm for accomplishing this. Measures for raising the fertility of soils and employing progressive technologies have been developed and are being implemented. Thus, merely by employing an industrial technology for the cultivation of corn on an area of 1.3 million hectares, it is expected that the production of grain will be increased by 5 million tons. The yield potentials for barley, peas and groat and other crops are also great. With each passing year, a number of farms are obtaining 50 or more quintals of winter wheat per hectare. In Cherkasskaya Oblast, for example, notwithstanding last year's unfavorable conditions, the Dnepr, imeni Krupskaya and Radyans'ka Ukraina kolkhozes obtained more than 40 quintals of grain per hectare.

This year the republic's winter crop fields are considerably larger than those of last year. The condition of the wheat following the winter is for the most part good and this gives us every reason to expect a good harvest. Taking into account the peculiarities of each field, the specialists are determining the type of fertilizer to be employed and the period for its application. All measures are being undertaken to ensure that this year an average of no less than 31-32 quintals of grain, 312 quintals of sugar beets, 412 quintals of potatoes and 156 quintals of vegetables are obtained from each hectare.

Commencing with the very first days of the sowing operations, the farms in the Ukraine relied very heavily upon the extensive introduction of a progressive industrial technology for the cultivation of agricultural crops. With the exception of corn, it is being employed for the growing of sugar beets, sunflowers, soybeans, potatoes and spinning flax.

The complex plans for the carrying out of the spring field work reflect thrifty concern for making maximum use of the experience available in the all-round utilization of equipment and ensuring that the work is carried out using the group method and hourly schedules. An example of this is the Kolkhoz imeni Zhdanov in Shargorodskiy Rayon, Vinnitskaya Oblast. Here the mechanized detachment is headed by the kolkhoz's chief agronomist, A. Lishchina. There are 110 workers assigned to the detachment. They work in specialized teams: moisture retention, harrowing of winter crops and perennial grasses, pre-sowing tilling of soils, fertilizer and herbicide applications, preparation of seed, sowing of spring crops, technical support... There is a team for providing cultural-domestic and medical services for those workers carrying out field work; it supplies hot food and the principal necessities of life.

The fine attention given to details and the efficient organization of labor in the detachment makes it possible to carry out the work rapidly and in a high quality manner. The units are operated in two shifts throughout the entire period of daylight. Moisture retention work was carried out on 1,550 hectares using 14 units and just as planned -- within 27 working hours. Pre-sowing cultivation work in behalf of the early grain crops and annual grasses was completed in just 70 hours. The sowing of the spring crops unfolded in a harmonious manner.

"There is still a considerable amount of work to be carried out" stated the chairman of the kolkhoz A. Podolyan, "We are sowing winter grains on 160 hectares and early grain crops and pulse crops on 325 hectares. Our goal is to obtain 48 quintals of grain from each of 1,410 hectares of winter grain crops and, in all, to harvest 67,680 quintals of grain -- 18,600 more quintals than the figure called for in the plan. We hope to obtain 450 quintals of sugar beets from each of 640 hectares."

Many examples could be cited of shock work being performed out on the fields. This year the rural workers in Vinnitskaya Oblast are competing to obtain 33.2 quintals of grain per hectare and, in all, 3.9 million tons of grain.

The neighboring farmers -- the grain growers in Khmel'nitskaya Oblast -- have their own concerns out on the spring fields. The peculiarities of this present spring period dictate a strong need here for the retention and proper use of the spring moisture. The task is complicated by the fact that a portion of the spring crops must be sown following spring plowing and some areas require additional sowing or resowing of the winter crops. All of this increases the volume of work to be carried out on the spring fields.

But the difficulties are being countered by experience, skill and creative maneuvering. Upon the advice of specialists, the field work is being carried out taking into account the specific circumstances. The areas for additional sowing and for the resowing of winter crops have been designated on each farm.

Special importance is being attached to preparing the soil on those areas where autumn plowing was not carried out. In the interest of preventing excessive drying out of the soil, reducing the work periods and raising the quality of the work, surface tilling of the soil using sweeps and disk implements is being employed instead of spring plowing.

In light of this year's spring conditions, special importance is being attached to ensuring the correct organization of labor and highly productive use of the equipment.

"In the plans for the farms" stated the 1st Secretary of the Khmel'nitskaya Oblast Committee of the Communist Party of the Ukraine, T. Lisovoy, "the number of units, the areas in which they are to be operated and the times at which they are to be transferred to other sectors are clearly set forth. The plans call for the use of the group method and complex detachments and specialized teams have been organized for tilling the soil, applying fertilizers and herbicides, carrying out the sowing work and tending the crops. The decree of the CC CPSU, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee concerning the all-union socialist competition for the successful fulfillment and over-fulfillment of the tasks for the Eleventh Five-Year Plan will be of assistance in implementing the historic decisions handed down during the 26th CPSU Congress."

The workers in the Soviet Ukraine are striving to fulfill their plans and obligations in an honorable manner and to please the homeland by producing a fine harvest.

The early grain crops have already been sown on more than 4 million hectares throughout the republic, considerably more than the area sown by this same time last year. The farms in the Crimea and in Nikolayevskaya, Odesskaya and Khersonskaya Oblasts have completed their sowing of early grain crops. The farms in Volynskaya, Zaporozhskaya, Zakarpatskaya and Kirovogradskaya Oblasts are nearing completion of this work. A top dressing has already been applied to almost 7 million hectares of winter crops, 2 million more hectares than last year.

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MAJOR CROP PROGRESS AND WEATHER REPORTING

BRIEFS

SPRING WORK CAMPAIGN--L'vov, 20 Apr--The busy period of spring work has never commenced earlier in the Carpathian region. A top dressing is being applied to the winter crops, perennial grasses and natural feed lands. The sowing units are in operation out on the fields. They are presently being used in two shifts on farms in Radekhovskiy and Busskiy Rayons. The quality of the work is high. Control has been established over observance of the sowing norms, over uniformity in the application of fertilizers and over the correct adjustment of the mechanisms. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Apr 81 p 1] 7026

FEED FROM RECLAIMED LANDS--L'vov--Water-logged land in the Carpathian region is being converted into a storehouse for feed protein. Land reclamation work has been completed on 1,000 hectares of new land. This land will be used for pulse crops and perennial grasses. This year the farmers in L'vovskaya Oblast expect to obtain no less than 40 percent of their overall quantity of feed from reclaimed lands, as a result of having raised their fertility and having improved the structure of the areas under crops. [Text] [Moscow GUDOK in Russian 7 Apr 81 p 1] 7026

GRAIN CROP SOWINGS COMPLETED--L'vov, 13 Apr--The oblast's farmers have sowed their grain and pulse crops on a rapid basis and during the best periods. The timely preparation of the equipment and personnel and great organizational work on the part of the local party and economic organs were of assistance in carrying out the work during the optimum periods. Just as in previous years, the Ipatovo method for equipment usage proved to be of great assistance and also double shift sowing operations and around-the-clock work -- for preparation of the soil. The sowing of spinning flax and sugar beets and the planting of potatoes are presently being carried out throughout the oblast at a maximum tempo. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Apr 81 p 1] 7026

HIGH POTATO YIELDS--Cherkessk, 6 Apr--The potato growers in the Karachayevo-Cherkesskaya AO began planting their potatoes 10 days earlier than usual. The farms in Zelenchukskiy Rayon made a fine start. Very efficient work is being performed by the machine operators at the Znamya Kommunizma, Oktyabr' and imeni Lenin kolkhozes. The conveyer belt-ridge planting method is being introduced into operations at all of the farms. The farmers in the autonomous oblast became acquainted with it during an oblast seminar and during courses taken at the North Caucasus Scientific-Research Institute of Mountain and Piedmont Farming. As a result of the extensive use of this progressive technology, the cropping power of the potatoes will be raised to 160 quintals per hectare, or 43 quintals more than the average annual yields obtained during the Tenth Five-Year Plan. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 7 Apr 81 p 1] 7026

ORGANIC FERTILIZER FOR THE FIELDS--Odessa, 15 Apr--Just as soon as the weather conditions permitted, the fertility detachments commenced operations on all of the farms in the oblast. A campaign to last 1 month, for moving local fertilizers out onto the fields, was announced. More than 400,000 tons of farmyard manure have been arranged in piles in Tatarbunarskiy Rayon, the amount called for in the plan for the quarter. At the Kolkhoz imeni Dzerzhinskiy in Belgorod-Dnestrovskiy Rayon, a detachment was operating three powerful tractors of the T-150 class, with nine trailers and 18 motor vehicles. Each day, 750-800 tons of manure are being handled here. On farms in ovideopol'skiy, Frunzenskiy and other rayons, the fertilizers are being delivered to the fields at a high rate of speed. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 15 Apr 81 p 1] 7026

NEW POTATO VARIETY--Odessa--A new variety of potato, Odesskiy-65, has appeared for the very first time on fields in the Black Sea region. Under the conditions which exist in the southern part of the republic, this variety will provide two full-value yields per season. Today the farms of the agro-industrial Odesskplodo-ovoshchprom Association commenced planting it using an industrial technology. [Text] [Moscow TRUD in Russian 4 Apr 81 p 1] 7026

SPRING BARLEY SOWINGS--Donetsk--The warm air which has reached the Donetsk Steppe has accelerated the ripening of the soil. The sowing of spring barley has commenced on many farms. In addition to the tested Donetskiy-6 and Donetskiy-8 varieties, new high yield varieties are making an appearance out on the fields. The Zernogradskiy-73 barley variety has proven its worth. It furnishes up to 43 quintals per hectare on non-irrigated land and on irrigated tracts -- more than 60 quintals of grain. Odesskiy-82 and Odesskiy-84 are being sown on considerable areas. All of these varieties are resistant to drought and lodging. [Text] [Moscow TRUD in Russian 3 Apr 81 p 1] 7026

UKRAINIAN SUGAR BEET SOWINGS--Kiev, 17 Apr--The Ukrainian beet growers are using each working hour in behalf of the harvest. Today they completed sowing work on 1 million hectares of arable land. This is more than one half of all of the tracts allocated for this most important technical crop. The collectives of specialized brigades and teams have organized their work in keeping with the Ipatovo method and they are preventing any pause from developing between the preparation of the soil and the planting of the seed. Just as on the grain fields, extensive use is being made of dual soil cultivation and sowing units. All of these factors enabled many farms and entire rayons in Vinnitskaya, Poltavskaya and Chernovitskaya Oblasts to complete their sowing operations by this time. The quality of the work is being monitored by staffs which, in keeping with the example set by the Yampol' workers, includes representatives of the processing enterprises. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 18 Apr 81 p 1] 7026

SUGAR BEET SALES TO STATE--Kiev --The Ukrainian farmers completed sowing their sugar beets on 1 million hectares of arable land in an unprecedented short period of time. The seed has been planted on more than one half of the tracts allocated for this crop. The rapid work tempo was achieved based upon the introduction of the Ipatovo method for organizing labor in all areas and the use of twin soil cultivation and sowing units. This year the rural workers have vowed to sell no less than 50.5 million tons of roots to the state. [Text] [Moscow GUDOK in Russian 7 Apr 81 p 1] 7026

UKRAINIAN SOWING OPERATIONS--Kiev --The border of the sowing operations in the Ukraine has reached the northern rayons. Yesterday the farmers completed planting their seed on the first million hectares. Wide-swath units, which raise the labor productivity of the machine operators by a factor of 2-3, are being employed out on the fields. In a number of oblasts, hourly schedules have been introduced into operations, schedules which accurately indicate the periods for carrying out the agrotechnical measures. [Text] [Moscow GUDOK in Russian 4 Apr 81 p 1] 7026

SUGAR BEET GOAL--Kirgiz SSR--To obtain no less than 390 quintals of sugar beets per hectare and to sell 1 million tons to the state -- such is the goal of the Kirgiz beet growers for the first year of the Eleventh Five-Year Plan. In order to achieve this goal, deep fall plowing was carried out during the autumn period following an application of fertilizer to the soil. During the winter the farmers improved their agrotechnical knowledge and many of them thoroughly acquainted themselves with the experience obtained in growing root crops using the industrial technology. The spring weather has been unstable. The sunny days have been replaced by frequent rainfall and this has hampered field work. However, the machine operators are striving to utilize each good hour of working time in the most productive manner possible. At a number of piedmont farms the sowing of beets is still in full swing. Taking advantage of the experience of leading workers, an attempt is also being made here, in conformity with the peculiarities of this year's spring period, to do everything possible in order to achieve high yields. Similar measures are being undertaken by all of the republic's beet growing teams. [by I. Masaulov] [Excerpts] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Apr 81 p 1] 7026

ALFALFA SOWING COMPLETED--Ashkhabad, 16 Apr--The oblast's farmers were the first in the TuSSR to complete their sowing of alfalfa. New fields of perennial grasses have been planted on more than 10,500 hectares and these fields are already covered with green seedlings. For the republic on the whole, more than 40,000 hectares have been sown in alfalfa -- two times more than by this same time last year. [by S. Kim] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 17 Apr 81 p 1] 7026

TURKMEN COTTON SOWINGS--Turkmen SSR--The introduction of progressive methods for the cultivation of cotton and leading agronomic methods -- represents a distinctive feature of this year's sowing campaign being carried out throughout the entire republic. Thus, workers specializing in the production of fine-fibred cotton in Kaakhkinskiy Rayon are today sowing more than 6,000 hectares in ridges. As a result of improved water-salt and warm-air regimes in the soil, the seed germinates several days earlier and healthy and strong seedlings are obtained which are capable of enduring extremely unfavorable weather conditions. At the kolkhozes imeni Zhdanov, Pravda, Kommunizm and Moskva, a large portion of the plantations is being sown in ridges. Here they expect to obtain an increase of from 2 to 5 quintals of raw cotton per irrigated hectare. For the rayon on the whole, the increase in silk cotton will reach 1,000 tons. With each passing day, the front of work being carried out on the republic's main fields is expanding. At the Murgab, Tedzhen and Prikopetdag Oases, where the entire production of valuable fine-fibred varieties of cotton is concentrated, the sowing operations are coming to a close. The farmers in Chardzhouskaya and Ashkhabadskaya Oblasts are commencing their busy season of work. More than 300 large mechanized detachments are in operation. In response to the 1 May slogans of the CC CPSU, the grain growers are doing everything required of them in order to successfullv complete their sowing work and fulfill their socialist obligations: to sell no less than 1.22 million tons of raw cotton to the state this year, including 250,000 tons of fine-fibred cotton. [by S. Kim] [Excerpt] [Moscow SEL'SKAYA ZHIZN' in Russian 16 Apr 81 p 1] 7026

ACCELERATED COTTON SOWINGS--Ashkhabad--The virgin land brigades of Chardzhouskaya Oblast, which are developing the right bank region of the AmuDar'ya River, have fulfilled an important point included in their obligations. They were the first in Turkmenistan to complete sowing their cotton. Only 7 working days were required in order to do this. The Ipatovo method of equipment utilization was of great assistance with regard to accelerating the work. The plowing work was carried out around-the-clock and the sowing operations -- in two shifts. All of the cotton growing farms in the southern part of the republic joined in the sowing campaign. [Text] [Moscow GUDOK in Russian 7 Apr 81 p 1] 7026

FINE SOWING PREPARATIONS--Dushanbe, 10 Apr--In the valleys of Tadzhikistan the orchards are blooming, the grasses are turning green and once again it is time to sow the spring crops. This year a conversion will be made throughout the republic to cultivating corn using industrial methods. Such sowings are being carried out on 12,000 hectares. The farmers in Kurgan-Tyubinskaya Oblast made fine preparations for their sowing work. On farms in Shaartuzskiy, Kabodnenskiy and Vakhshskiy Rayons, irrigated tracts were made available for the growing of grain corn. Specialized brigades equipped with a complex of machines and mechanisms which fully exclude manual labor were created here. [by K. Madaliyev] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 11 Apr 81 p 1] 7026

VEGETABLE AND MELON SOWINGS--Nukus, 16 Apr--The Nukus Sovkhoz, a large specialized farm, was the first in the Karakalpakskaya ASSR to commence sowing vegetable and melon crops. Other farms in this autonomous republic have already commenced sowing operations on their vegetable raising plantations. [by B. Kuryshev] [Moscow SEL'SKAYA ZHIZN' in Russian 17 Apr 81 p 1] 7026

TOP DRESSING APPLIED--Frunze--The work of applying a top dressing to the winter fields in Kirgizia has been completed. Up to 2.5 quintals of mineral fertilizer have been applied to each of 302,000 hectares. The experience of previous years has shown that this agricultural measure makes it possible to obtain up to 5 additional quintals of grain on the average. This year the republic's grain growers have vowed to obtain 1.45 million tons of grain. [Moscow TRUD in Russian 31 Mar 81 p 1] 7026

HIGH SOWING RATES--Dushanbe, 11 Apr--The republic's farmers are sowing their cotton under complicated weather conditions. An unexpected snowfall and a sharp cold snap in early April caused great losses in the early seedlings and slowed down the sowing operations. Thus the farmers are presently carrying out this work with redoubled energy. The cotton fields in Kurgan-Tyubinskaya, Leninabadskaya and Kulyabskaya Oblasts and in the Gissar Valley were sowed very rapidly. Mechanized detachments of the kolkhozes imeni Lomonosov and Iskra in Shaartuzskiy Rayon carried out resowing work on hundreds of hectares of damaged tracts in just 25-30 hours. Such high sowing rates are typical for the kolkhozes and sovkhozes in Matchinskiy, Kolkhozabadskiy, Moskovskiy, Kumsangirskiy, Vakhshskiy and other rayons. Here the plans call for the cotton sowing work to be completed in just 4-5 days. Hundreds of units are carrying out ridging work for irrigation purposes and applying organic and mineral fertilizer top dressings to the crops. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 12 Apr 81 p 1] 7026

APRIL SNOWFALL--TaSSR--The residents of Dushanbe and surrounding regions were surprised beyond words by an abundant snowfall which occurred on the night of 3 April. Snow during the month of April is an extremely rare and unusual occurrence in the southern part of the country. Only the previous evening fine spring weather prevailed, with the temperature being 22-24 degrees. And then suddenly a sharp cold snap developed and the temperature dropped to zero. This was followed by rain and subsequently by snow. According to data supplied by the Weather Bureau of the republic's Hydrometeorological Service, the last time such a phenomenon occurred was in 1967. Similar to that occasion, the sharp drop in temperature and the snowfall were caused by the invasion of large masses of cold arctic air. After transiting the mountain ridges and depositing a layer of snow, the masses of cold air moved on in the direction of the regions of Pamir. At the present time, the required measures have already been taken to ward off the possible consequences of this natural phenomenon. [By N. Yatsenko] [Text] [Moscow TRUD in Russian 4 Apr 81 p 4] 7026

COTTON-ALFALFA CROP ROTATION--Andizhan--A "green" production line was operated in Uzbekistan. Yesterday the first mowing machines were moved out onto the oblast's alfalfa fields. Cotton-alfalfa crop rotation plans are being introduced into operations on an increasing scale throughout the republic. Such plans make it possible simultaneously to raise the cropping power of the "white gold" and to strengthen the feed base of animal husbandry. This year the decision has been made to procure almost 7,500 tons of coarse feed alone -- considerably more than the figure for last year. [Text] [Moscow TRUD in Russian 2 Apr 81 p 1] 7026

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LIVESTOCK FEED PROCUREMENT

IMPORTANCE OF PASTURAGE PERIOD STRESSED

Minsk SEL'SKAYA GAZETA in Russian 18 Mar 81 p 2

[Article by F. Mirochitskiy, deputy minister of agriculture of the BSSR: "Complete Readiness for the Pasturage Period"]

[Text] In his speech at the 26th CPSU Congress Comrade L. I. Brezhnev said, "Today the area of livestock raising is the shock labor front in the village." In this branch, intensive plans have been established in the republic for the first year of the 11th Five-Year Plan. For example, it will be necessary to increase the procurement of livestock and fowl by 11 percent as compared to last year, and of milk by 6 percent. Such a growth pace can be achieved only through the appropriate level of management.

The circumstances oblige all livestock farmers, directors and specialists of kolkhozes and sovkhozes and of agricultural organs to create a large degree of demandingness in work and to exhibit maximum activeness. Shortcomings must be decisively eliminated and everything possible must be done to ensure that the care and feeding of livestock during this difficult and complex period of overwintering is managed clearly. Supplementary sources of feed resources must be included, forage must be utilized more efficiently, the productivity of animals should not be lowered and products should arrive at dairy plants and meat combines rhythmically and according to schedule.

Unfortunately, many rayons and farms have tolerated a drop in the productivity of milk and meat as compared to the same period last year. Meanwhile the possibility does exist to make up for the underproduction by completing overwintering in an organized manner and by effectively utilizing the summer pasturage period. It is necessary to think about that right now and to seriously deal with all questions that arise. Reserves must be sought out now.

Naturally, we have high hopes for the summer. At the beginning of the pasturage period kolkhozes and sovkhozes will have more livestock and the procreation period will basically be completed. Our goal is to increase gross milk production by 16 percent during the pasturage period in the republic as a whole and products from raising livestock and fowl by 22 percent. It is this growth that will compensate for the losses that were tolerated in the winter and that will secure the fulfillment of the annual plan for the sale of milk and meat to the state.

Thus, the second quarter of the year must become pivotal in raising the productivity of animals. The most important factor here is green fodder. Creating sufficient supplies of this is the primary duty of all enterprises. Each standard head of large-horned cattle should be fed no fewer than 60 kilograms of green mass in the course of the summer period. Long-term data attests to something else--during this time only 38-42 kilograms were supplied. Consequently, radical measures are needed to better organize the green conveyor.

In production plans for green fodder it is important to establish a place and time for each feed crop. Winter rye will remain the primary crop. Last year it was sown on 200,000 hectares for feed purposes. This is sufficient.

The condition of the pastures is very important. Today this is the largest and most realistic source for increasing livestock production output. At the present time each cow in the public and private sectors receives 0.63 hectares of pasture lands. This quantity of pastures fully satisfies the needs of the dairy herd for green fodder. However, not all of them are sufficiently productive, and this is a serious shortcoming.

In the republic there are many enterprises and rayons in which large and stable grass harvests are achieved each year as a result of the good quality of management of the meadow and pasture sector. Over 7,000-9,000 feed units are produced by a hectare of improved pastures in Zavety Lenina Kolkhoz of Maloritskiy Rayon, Zavety Lenina Kolkhoz of Stolinskiy Rayon, Zarya Kommunizma Kolkhoz of Ivanovskiy Rayon, Sovetskiy Sovkhoz of Pruzhanskiy Rayon, the 21 S'yezd KPSS Kolkhoz of Rechitskiy Rayon, 3 Internatsional Kolkhoz of Zhitkovichskiy Rayon, Progress Kolkhoz of Grodnenskiy Rayon, the Kolkhoz imeni Lenin and the Svetlyy Put' Kolkhoz of Molodechnenskiy Rayon and many others. Korelichskiy, Molodechnenskiy, Kletskiy and Kirovskiy rayons produce 30-35 quintals of feed units per hectare on such pastures. This rich experience should be introduced everywhere.

The Kolkhoz imeni Kalinin of Nesvizhskiy Rayon can serve as an example of the skilful organization of summer upkeep for animals. Here pasture productivity is never lower than 6,000-7,000 feed units per hectare. Enterprises examine them ahead of time, clear them of debris, harrow them on schedule and apply mineral fertilizers, particularly nitrogen.

A permanent mechanized link having the necessary equipment cares for the pastures. Wages for herdsmen and link members depend on the products that are obtained, and effective competition has been organized. All of this enables the kolkhoz to achieve average daily milk yields during the summer period of 14-15 kilograms per cow and an average daily weight gain of 800 grams per large-horned cattle being fattened.

Unfortunately, the same situation does not exist everywhere. There is only one answer--each enterprise must have productive pastures allocated on the basis of 0.50 hectares per cow, including the herd belonging to the private sector. In those areas where such large areas for pasturage do not exist, they should be created out of haylands or grass plots on plowland nearest to the farm.

In a number of places pastures are too far from farms, which has a negative effect on the efficiency of utilizing them. With the goal of curtailing the driving of animals it is essential to replace distant pasture lands by plots of haylands or grasses of equal value located close to the farms. In order to utilize pastures more efficiently in all areas allocated for this purpose, maps and schemes should be developed with a breakdown according to enclosures and with an indication of the schedule for the using up of portions by cattle.

In order to correctly organize pasture care, each kolkhoz and sovkhoz must employ links that have at their disposal the necessary machines and mechanisms. Their duties include the installation and repair of barriers, cattle tracks, water-supply platforms, the top-dressing of pastures with fertilizers, harrowing, the supplementary sowing of grasses on grazed-out or sparsely-grassed lands, the combatting of weeds, the cutting down of uneaten wastes and irrigation. It is important to interest the link members in their work and to establish supplementary payments for the model upkeep of pastures and the high productivity of livestock.

Success depends greatly on the timely organization of all operations related to the departure of livestock for pastures. Plots for winter crops and early grasses must be selected ahead of time and the necessary work there must be completed--the removal of waters resulting from thaws and the early top-dressing with mineral fertilizers. The agronomical service must correctly distribute mineral fertilizers and apply doses to meadows and pastures in quantities that would guarantee the planned yield of green mass.

Prior to the beginning of the pasturage period each enterprise must form a herd of animals while considering their economic significance and age and sex composition. Places for rest, milking and for providing water must be determined. Permanent herdsmen must be selected from among the most experienced livestock farmers and special courses must be provided for them on pasture methodology. Grazing must follow only the enclosure and portion methods with the use of electrical fences.

The essence of the intensive utilization of pastures is the short period of grazing followed by a longer period in which the grass is allowed to grow. This is achieved by introducing a system of portion pasturage. Under such a system, animals are allowed to graze for a day on a particular area, which is then allowed to remain unused for 3-4 weeks. In this case there will always be young and fresh grass.

Within the system of measures on the organization of summer livestock upkeep, the setting up of a watering place is very important. Scientific studies have determined and practical experience has confirmed that with automatic watering the milk yield of cows increases by 10-19 percent and the weight gain of animals being fattened increases by 20 percent. It has also been shown that if the dairy herd is watered only once per day the milk yield drops by 15 percent. In connection with this, if there is no automatic means of water supply, animals should be provided with water 3-4 times per day. It should be kept in mind that on very hot days the need for water increases by 10-15 percent.

The effectiveness of pasture upkeep of livestock depends greatly on the cadres working on farms. A farm can have a highly productive herd, good pastures, a well-equipped watering place, but if skilful hands are not there to do the work, and if skill and experience are not utilized, the desired results will not be achieved. This is why constant concern and attention must be directed at people working in livestock raising. In addition to creating normal conditions for daily work and everyday life, livestock farmers should be provided with moral and material incentives for high indicators.

The organization and carrying-out of summer upkeep of cattle and controls over this important work must be realized in the strictest of terms. Circumstances should be organized in such a way as to generalize the success of one worker as the achievement of the entire farm. When we speak of the evaluation of what has been achieved, it is necessary to make a comparison not only with last year's levels but also with the goals that were planned for the current year.

The directors and specialists of kolkhozes and sovkhozes are obliged to demonstrate their concern for allocating pastures for the private livestock of kolkhoz farmers, workers and employees as well so that the summer period yields a maximal quantity of products.

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LIVESTOCK

INCREASE IN EFFECTIVENESS OF PRODUCTIVE CAPITAL IN ANIMAL HUSBANDRY REQUIRED

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 1, Jan 81 pp 36-38

[Article by A. Sokol, A. Bykanov, V. Shebel'nichenko and I. Rossokha: "Raising the Effectiveness of Productive Capital in Animal Husbandry"]

[Text] Among the factors which affect the effectiveness of animal husbandry, a very important role is played by fixed productive capital. High returns are obtained not only as a result of increasing the amount of fixed productive capital, but also from the correct formation of their structure. This is dependent mainly upon the qualitative structure of the capital and it is of great practical importance with regard to revealing those factors associated with raising the availability of productive capital, the capital-labor ratio and the capital-output ratio.

In 1966, the value of the fixed productive capital in cattle husbandry at kolkhozes in Khar'kovskaya Oblast was 178.5 million rubles, in 1975 --393.2 and in 1979 --518.8 million rubles. During this period, the amount of fixed capital per cow increased by a factor of 2.6 and in 1979 it amounted to 1964 rubles.

The growth in the level of availability to the farms of fixed productive capital, and particularly mechanization equipment, brought about a reduction in the labor-intensiveness for cattle husbandry output. Thus, during the 1966-1979 period, labor expenses per quintal of milk at kolkhozes in Khar'kovskaya Oblast decreased on the average from 16.94 to 10.1 man-hours, or by 44.4 percent.

The increase in capital availability, in addition to lowering the expenditures of live labor per quintal of output, brought about a change in the structure of expenditures for the production of milk and particularly in the ratio between the material and labor expenditures. On the average, for kolkhozes in Khar'kovskaya Oblast, the proportion of labor expenditures compared to overall expenditures for the production of milk during the 1966-1970 period decreased from 48.8 to 30.4 percent, while the material expenditures increased from 51.2 to 69.6 percent. On many farms throughout the oblast, the expenditures for wages associated with the production of milk have not exceeded 25-30 percent in recent years.

A reduction in labor intensiveness in cattle husbandry output is a natural process. Simple manual labor is replaced by highly specialized machine labor and this represents one aspect of scientific-technical progress in this branch. However, taking into account the influence of other factors on the mentioned process, skilful control must be exerted over them based upon thorough knowledge of the economic laws associated with the development of social production. The essence of the problem boils down to the fact that the rates for lowering direct labor expenditures are lower than the rates for growth in material expenditures per unit of output. Thus, at kolkhozes throughout the oblast and for the 1966-1979 period, the material expenditures per quintal of milk increased from 8.26 to 17.98 rubles, or by a factor of 2.2, while direct labor expenditures during this period decreased by 40.4 percent, owing to the fact that the production cost for cattle husbandry output increased.

The material expenditures increased as a result of increases in the production cost for the feed, in operating expenses and in the amortization of fixed productive capital. For example, for a certain increase in feed expenditures per quintal of milk, on the average for kolkhozes throughout the oblast (from 1.65 to 1.74 feed units, or 5.5 percent), the cost of the feed increased from 3.72 to 9.05 rubles, or by a factor of 2.4. This was the result of a rise in costs for internally produced feed and also for purchased feed. Thus the cost for 1 quintal of feed units in feed for the milking herd during this period increased from 2.25 to 5.39 rubles, or by a factor of 2.4, whereas the productivity of the cows increased by only 15.9 percent. Growth in the production cost of the milk led to a reduction in profitability and at a portion of the farms -- even to losses being sustained in the production of this product.

Studies have shown that simultaneously with increasing the availability of capital for animal husbandry, a reduction takes place in the capital-output ratio. In the process, a certain trend is observed: the higher the rates for increasing capital, the worse they are utilized. For example, at kolkhozes in Khar'kovskaya Oblast, for an average annual growth in the value of fixed capital in livestock husbandry of 12.8 percent, the reduction in capital-output ratio was 2.5 percent.

A similar regularity is being observed at sovkhozes belonging to the Khar'kov and Khar'kov-Rogan' Trusts, which specialize in the production of milk and vegetables.

Such a situation is explained by the fact that the value of the productive capital exceeds to a considerable degree the rates for increasing the number of livestock and their productivity. In raising the effectiveness of animal husbandry and in addition to constantly increasing capital investments, great importance is attached to the level of utilization of all elements of the fixed and circulating productive capital. This is borne out by the experience of leading farms.

By way of an example, allow me to cite data for the Berezovka Sovkhoz in Khar'kovskiy Rayon (see Table).

The principal conditions for realizing a considerable improvement in this branch at the mentioned farm consist of employing a rational and all-round approach for solving the problem. Additional capital investments are being employed mainly for the modernization of existing facilities. At the same time, the level of mechanization of production processes at these facilities is being raised and a stable feed base is being created. In 1978, for example, the average cropping power for fodder root crops at the sovkhoz was 538 quintals per hectare and on irrigated tracts it is reaching as high as 1,000-1,200 quintals per hectare. The cropping power of perennial grasses for green feed under irrigation conditions amounted to

853 quintals per hectare and corn for silage and green feed, grown on the basis of a new technology involving the use of irrigation and a complete dosage of mineral fertilizers on an area of 120 hectares, was raised to 650-700 quintals per hectare.

Indicators	1975	On the average for 1977-1978	1975 in % of 1977-1978
Number of head	750	825	110.0
Milk yield per cow, kg	2437	3753	154.0
Amount per cow, rubles:			
fixed capital	925	948	102.5
circultating capital	468	721	154.1
feed (in feed units), quintals	35.9	50.0	139.3
Capital-labor ratio, rubles	9910	9420	95.1
Labor expenditures per quintal of milk, man-hours	7.4	5.1	69.0
Production cost per quintal of milk, rubles	17.45	17.78	101.3
Profitability level for milk production, %	13.8	52.3	+38.5
Capital-output ratio, rubles	0.71	0.91	128.2

The fixed productive capital produces the greatest economic effect when it is in an optimum ratio with the circulating capital. Quite often the effectiveness of the fixed capital decreases as a result of a shortage of feed, fertilizers, spare parts and other materials. At the same time, surplus circulating capital adversely affects the effectiveness of production operations. Moreover, the amount of fixed capital per unit of fixed capital value is dependent upon the production specialty of a farm and upon the combining of the crop and animal husbandry branches at the farms. The experience of leading farms indicates that the most acceptable ratio is that of 70-80 kopecks of circulating capital for every ruble of fixed capital.

An analysis of the structure of the resources invested in animal husbandry reveals considerable disparities between the investments in construction and in the other spheres. According to data furnished in the annual reports of kolkhozes throughout the oblast and on the average for the 1976-1979 period, of the overall total of 102 million rubles of capital investments placed in operation, 66.5 million rubles were expended for the construction of facilities, 31.6 million rubles for the installation of equipment, 3.1 million rubles for other capital expenditures and approximately 800,000 rubles for irrigation-land reclamation measures and the development of reclaimed lands. Approximately 32 million rubles were set aside for developing the feed base. Beyond any doubt, this is one of the chief reasons why the requirement for forage is being satisfied by only 70-80 percent and this in turn is exerting an effect on the slow rates of growth in the productivity of the animals.

In connection with the great scales of production taking place in complexes and also taking into account the rhythmic and production line nature of their operations, it would seem to be only proper to raise the subject of establishing feed production as an independent branch and creating specialized subunits for the guaranteed and continuous supplying of the animals with diverse and full-value feeds during all seasons of the year. Such subunits enjoy the rights of cost accounting units and must be provided with the necessary growing areas, man-power, machines, mechanisms and fertilizers. Measures for providing them with material and moral incentives must be developed. The wages for workers attached to these subunits must be coordinated with the final operational results of the complex. The experience of a number of oblasts in the Ukraine (Nikolayevskaya and others) confirms the practical importance and economic feasibility of creating specialized feed production operations.

The practice of incomplete supply and incomplete satisfaction of the requests of the farms for machines and equipment continues to persist and, as a result, different levels of mechanization of individual operations have developed. For example, the watering of livestock on large-horned cattle farms of kolkhozes in Khar'kovskaya Oblast is mechanized by 99.7 percent, the issuing of feed -- by 48.8 percent, the milking of cows -- by 97.2 percent and the removal of farmyard manure -- by 85.8 percent.

There are still a considerable number of facilities on the farms which were built on the basis of obsolete plans (303 buildings in which 7.1 percent of the animals are being maintained). Existing mechanization equipment cannot be used in these facilities unless they are first re-equipped. This requires considerable capital investments for their modernization.

More complete and rational utilization and workloads are required for the available technical resources. Thus, in early 1979, the kolkhozes in Khar'kovskaya Oblast were failing to make use of the following items of equipment: 21 multi-purpose feed mills, 13 feed mixers, 17 straw and silage choppers, 28 stationary crushing units, 28 stationary feed distributors for large-horned cattle, 24 sets of equipment for granulated grass meal, 15 conveyers for the handling of farmyard manure, 16 refrigeration units for the cooling of milk and nine sets of equipment for the pasteurization of milk.

It bears mentioning in this regard that the existing practice of supplying the kolkhozes with technical equipment in conformity with their economic status and requests for acquiring machines and equipment is inadequate and does not create the conditions required for the complex mechanization of animal husbandry operations. Economically strong farms purchase more technical equipment than do economically weaker ones and, as a result, the differences between them tend to intensify. However, the strong farms are not always able to procure their technical equipment in the optimum ratios and this leads to a reduction in the capital-output ratio. Moreover, the trend towards lowering this indicator is greater on those farms which have more capital and purchase more production equipment. All of this underscores the need for distributing the machines and equipment taking into account the level of technical equipping achieved by a farm, since similar type farms can differ by a factor of 2-4 in terms of this indicator.

One of the more important causes of a reduction in the capital-output ratio is an irrational change in the structure of the fixed productive capital of animal husbandry. This is associated with the fact that various structural elements of the fixed productive capital exert different influences upon the volume and effectiveness of output production. An increase in the proportion of productive livestock, machines and equipment (active portion) exerts a more perceptible influence upon the production results, with a lesser effect being generated by the facilities and installations (passive portion). Meanwhile, during the period analyzed, the proportion of the active portion of the fixed productive capital at kolkhozes throughout the oblast decreased while the passive portion increased. For example, compared to 1966 when productive livestock constituted 14.1 percent of the structure of fixed productive capital at kolkhozes in Khar'kovskaya Oblast, in 1979 -- 12.7 percent. At the same time, the proportion of buildings and structures is increasing from 61.7 to 66.3 percent.

The increase in the proportion of the mentioned capital results from the introduction of means and methods for producing animal husbandry products, which call for a large volume of construction of new facilities and the modernization of existing ones, an expansion in land reclamation and highway construction, the acquiring of new sets of machines and mechanisms and also increased costs for construction work, materials and equipment.

An analysis carried out at kolkhozes throughout the oblast during the 1966-1979 period has revealed that the cost of 1 horsepower, in procured power engineering equipment, increased during this period by 35.2 percent, 1 ton of mineral fertilizer -- by 42 percent, purchased mixed feed -- by a factor of almost 1.6, one livestock billet for large-horned cattle -- by a factor of 2.6 and the balance value for one head of cattle -- by a factor of 2.3. During this period the number of livestock billets for long-horned cattle increased by 13.4 percent and the number of livestock decreased by 0.2 percent. A typical feature is the trend towards a disruption in the proportionality between an increase in the capacities of calfhouses and cow barns. Thus, whereas the number of cows during the indicated period increased by 6.2 percent and the young large-horned cattle stock decreased by 3.6 percent, the number of livestock billets at cow barns decreased by 0.3 percent and at calfhouses they increased by 25.6 percent.

In order to raise the capital-output ratio, an extreme need exists for thoroughly taking into account the ratio for the construction of animal husbandry facilities, in conformity with the trends toward growth in the number of animals.

It is known that in order to convert an existing dairy farm into an industrial complex for the production of milk, 36-48 percent of the funds for the overall cost of the complex must be spent for new construction, in addition to expenditures for modernization. Meanwhile, the experience of a number of farms in Khar'kovskaya and other oblasts throughout the republic reveals that the proportion of capital investments can be reduced considerably through the modernization of newly made available calfhouses. This method for raising the capital-output ratio is presently being employed extensively on farms in Zaporozhskaya Oblast, where 2,185 facilities for the maintenance of large-horned cattle have been modernized and also in Dnepropetrovskaya (458 facilities and 52 farms), Krymskaya, Donetskaya and other oblasts.

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IMPROVEMENTS CALLED FOR IN MATERIAL-TECHNICAL BASE FOR SWINE RAISING

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[Article by Ya. Blyankman, doctor of economic sciences and head of a sector at BelNIIEOSKh and A.P. Shpak, candidate of economic sciences and senior scientific worker at BelNIIEOSKh: "Improvements in Material-Technical Base For Swine Raising"]

[Text] During the period of successful development of the scientific-technical revolution, the basis for raising the efficiency of animal husbandry is that of converting it over to an industrial basis. From an objective standpoint, this raises the requirement for the construction of large-scale technically improved livestock complexes and the concentration of capital investments. In this regard, great practical interest is being displayed in the comprehensive and economic validation of the proper dimensions for the livestock enterprises, their fixed capital and capital investments. In order to solve the established tasks, an economic evaluation is required for a particular branch of animal husbandry and its material-technical base, a justification for the planned conversion of the branches of production over to an industrial basis and a determination as to the economic effectiveness of these measures.

During the Ninth Five-Year Plan, the output of swine raising operations in the Belorussian SSR, compared to the overall meat balance (at all categories of farms), amounted to 39.3 percent, and in the production of meat by kolkhozes, sovkhozes and other state facilities -- 25 percent. Moreover, the pork production volumes are increasing considerably more slowly than the production of beef and poultry meat. Meanwhile, all of the opportunities are available within the republic for rapidly increasing the pork production volumes and for increasing the proportion of pork in the overall production of meat.

There are presently 1,671 farms engaged in the production of pork in the Belorussian SSR. On the average, a kolkhoz produces 950 quintals of product and a sovkhoz -- less than 1,700 quintals. The low level of production is conditioned by the limited opportunities for creating a proper feed base. Many farms, in addition to their swine raising operations, produce milk and engage in the fattening of long-horned cattle.

Analysis reveals that the majority of buildings employed in swine raising consist of facilities of average durability and soundness. The greater portion of the buildings (for 55 percent of the billets) reflect a depreciation of from 30 to 80 percent.

There are also high quality swine raising facilities available, but as a rule they have already been in use for 10-20 years. They consist mainly of installations which are considerably obsolete, that is, not all of them are suitable for the operation of machine systems. Studies and experience have shown that for the future it will be most advisable to use, for the production of pork, existing livestock facilities having an overall capacity of 1.7 million billets. Such facilities can be operated for roughly 10 years. It bears mentioning that only 36 percent of the available production facilities can be used for expansion, modernization or technical re-equipping during the next 2-3 five-year plans.

Experience has shown that the concentration of production at large enterprises offers important advantages over smaller swine farms. This is clearly apparent in the accounts for 1977, carried out at 18 large swine raising farms and complexes and furnished in Table 1.

The accounts revealed that from 1972 to 1977 the output-capital ratio for pork increased by 54.3 percent. Labor expenditures for the production of 1 quintal of output decreased by 24.1 percent. During this period of time, the mentioned production expenses for 1 quintal of pork increased from 176 to 206 rubles. In order to determine more correctly the effect of factors on the effectiveness of use of fixed capital in swine raising, correlational models were prepared with information materials for farms in various regions of the republic being processed.

The correlational models were composed for the following indicators of effectiveness: Y_1 -- labor productivity (pork productivity per worker engaged in the servicing of swine), thousands of rubles; Y_2 -- output-capital ratio per quintal of pork, rubles; Y_3 -- production cost per quintal of pork, rubles; Y_4 -- pork production per 100 hectares of arable land, quintals; Y_5 -- profitability of productive capital, %. Of the large number of factors which determine the effectiveness of swine raising operations and the utilization of the branch's fixed capital, the following were selected: x_1 -- capital-labor ratio (fixed capital per worker engaged in servicing swine), thousands of rubles; x_2 -- fixed capital per 100 hectares of arable land, thousands of rubles; x_3 -- size of farms, thousands of head; x_4 -- level of complete mechanization, percent; x_5 -- degree of availability of standard facilities for the swine, percent; x -- circulating capital per 100 rubles of fixed capital, rubles; x_7 -- circulating capital per 100 hectares of arable land, thousands of rubles; x_8 -- level of utilization of facilities, percent; x_9 -- swine density per 100 hectares of arable land, thousands of head; x_{10} -- proportion of swine raising output compared to overall marketable output, percent; x_{11} -- production cost for 1 quintal of feed units, rubles; x_{12} -- feed expenditures per quintal of pork, quintals of feed units.

The selection of the enumerated factors is carried out using logical and qualitative analyses, a comparison of dual and partial coefficients of correlation and a comparison of the t-criteria and the standardized coefficients of regression, to the extent that the factors influence each of the indicators of effectiveness examined. As a result, the most important factors were left in the regression equations drawn from the above. The equation types and their parameters are expressed in the following manner:

TABLE 1

Indicators For Large Swine Complexes Compared to Conventional Farms

	Kolkhozes and Sovkhozes	On farms and complexes, 12,000 or more head	Including		
			Borisovskiy Sovkhoz, 108,000 head	Voskhod Sovkhoz in Mogilevskiy Rayon, 24,000 head	Put' K Kommunizmu Kolkhoz in Grodnenskiy Rayon, 12,000 head
Output-capital ratio, rubles per quintal	285.7	324.9	247.7	516.2	173.1
Average daily increase in live weight, grams	294.0	462.0	529.0	488.0	555.0
Feed consumption per quintal of increase in live weight, feed units	8.5	5.9	4.6	5.2	5.1
Labor expenditures per quintal of increase in live weight, man-hours	29.0	7.9	3.2	5.4	12.0
Pork yield per livestock billet, quintals	0.8	1.0	1.4	0.9	1.7
Swine raising production output per individual worker engaged in servicing of swine, thousands of rubles	16.1	43.1	102.3	66.7	46.9
...per man-hour of direct expenditures, rubles	5.5	21.6	51.1	29.8	13.5
Profit obtained per 100 rubles of fixed capital, rubles	6.1	18.4	39.2	3.8	42.6
Production cost per quintal of increase in live weight, rubles	169.9	122.8	98.6	135.7	100.5
Corrected expenditures, rubles per quintal	205.6	163.4	129.6	200.2	122.1
Profitability level for pork production, %	9.7	44.9	89.9	20.7	82.4

$$Y_1 = -21{,}239 + 0{,}298x_1 + 1{,}709x_2 + 0{,}016x_4 + 0{,}048x_5 + 0{,}136x_6 + 0{,}034x_8 + 28{,}219x_9 + 0{,}063x_{10} \quad (1)$$

$$Y_2 = 711{,}566 + 5{,}900x_2 - 52{,}090x_3 + 0{,}068x_4 - 2{,}163x_6 - 0{,}914x_8 - 136{,}6x_9 - 6{,}907x_{10} \quad (2)$$

$$Y_3 = -90{,}866 + 0{,}313x_1 + 2{,}655x_3 - 0{,}052x_5 - 0{,}064x_6 - 24{,}454x_9 - 0{,}020x_{10} + 9{,}146x_{11} + 18{,}255x_{12} \quad (3)$$

$$Y_4 = -19{,}656 + 0{,}027x_2 + 14{,}835x_3 + 5{,}429x_7 + 0{,}069x_8 + 14{,}491x_9 + 1{,}770x_{10} \quad (4)$$

$$Y_5 = 13{,}564 + 0{,}022x_1 + 0{,}926x_3 + 0{,}003x_4 + 0{,}038x_6 + 0{,}013x_8 + 7{,}007x_9 + 0{,}114x_{10} - 0{,}685x_{11} - 1{,}168x_{12} \quad (5)$$

The positive influence on the effectiveness of use of fixed capital and production on the whole (equations 1-5) reveal: growth in the size of the farms; an increase in the density of the swine per 100 hectares of arable land; intensified production specialization and planned development of production capabilities. All of this underscores the advantages to be realized from the conversion of swine raising over to an industrial basis. But such a conversion is adviseable only when other measures are carried out, in addition to those enumerated. In particular, an increase in circulating capital of 100 rubles worth of fixed capital promotes an increase in labor productivity (equation 1), a reduction in the output-capital ratio (equation 2) and an increase in the profitability of use of productive capital (equation 5). The enumerated factors affect the level of labor productivity in swine raising by 62 percent, the output-capital ratio for its output -- 72, the production costs for output production -- 87, the pork yield per 100 hectares of arable land -- 79 and the profitability of the productive capital -- by 58 percent.

The analyzed factors should ideally be sub-divided into two groups: 1 -- those which serve to achieve economies in the use of labor; they are formed during the process of creating the material-technical base; 2 -- factors which bring about an increase in production efficiency and form during the course of farm operations. The first group of factors should include: capital-labor ratio; value of fixed capital per unit of arable land; size of farms; level of complex mechanization; degree to which standard livestock facilities available for swine. The second group includes: total amount of circulating capital per 100 rubles of fixed productive capital; their amounts per unit of arable land; level of utilization of facilities; swine concentration per 100 hectares of arable land; level of production specialization; production cost for feed; feed consumption per unit of output.

An analysis of the coefficients of partial and plural determination have shown that the factors of the first group make it possible to determine a level of labor productivity for 37 percent, output-capital ratio -- for 26, production cost -- for 5, level of pork production -- for 39 and profitability of productive capital -- for 6 percent. And the factors of the second group make it possible to determine the values for the reviewed indicators of effectiveness as being 25, 46, 82, 40 and 52 percent respectively. It thus follows that the proportions of the potential effect are examined during the stage of designing and planning the construction of large farms and they are apparent in the economic justification for the erection and development of farms and complexes. The final achievement of the design and planning indicators can only be realized by a production collective through the proper use of the most important conditions created in production.

In comparing the effect of the various groups of factors on the indicators for production effectiveness, attention can be drawn to the fact that the factors in the first group exert a comparatively greater influence on labor productivity and the level of pork production. These values increase quite naturally. However, their growth is not accompanied by a reduction in the production cost of pork or by an increase in its profitability. The maximum economic effect can be achieved through the complex and planned control over the factors.

The data obtained from studies was used for validating the amount and structure of the fixed capital required for converting the swine raising operations over to an industrial basis. The work was carried out by variants based upon pork production volumes planned by various organizations for the future. This data, together with the normatives for the output-capital ratio, developed for future years at BelNIIEOSKh, were used for computing the requirements of the republic's kolkhozes and sovkhozes for branch fixed capital, as shown in Table 2.

Variant I calls for minimal growth in output production, Variant II -- average and Variant III -- maximum growth. Moreover, the total amount of capital investments during the forecast period increases in a consistent manner. Thus, compared to Variant I, Variant III calls for the volume of capital investments to be increased by a factor of 1.7. The sequence of capital investments does not coincide in the variants according to periods. Taking into account the need for making maximum use of the existing material-technical base and the feasibility of establishing rational proportions between the construction of complexes and the modernization of existing farms, a program was composed for the capital construction of swine raising installations during the forecast period.

The overall volumes of capital investments in the construction of swine raising installations increase during the forecast period from Variant I to Variant III. In all instances, the same absolute dimensions were employed for the expansion and modernization of existing production capabilities: an increase of 275,000 animal billets during the next few years through the expansion of existing farms and 796,000 animal billets to be re-equipped, but not on the basis of expansion and during the subsequent period -- 296,000 and 845,000 animal billets respectively.

Overall, the ratio between the reviewed trends in capital expenditures for the next few years is structured as follows: according to Variant I for the construction of complexes -- 52 percent of the capital investments, for farm expansion -- 24 percent and the same percentage for their req-equipping; for Variant II -- 55, 23 and 22 percent respectively; for Variant III -- 61, 20 and 19 percent respectively; in subsequent years for Variant I -- 61, 20 and 19 percent, for Variant II -- 78, 11 and 11 percent, for Variant III -- 84, 8 and 8 percent. An analysis of the economic effectiveness of construction has revealed a high profitability for Variant III. Its implementation will make it possible to achieve an increase in output, per 100 rubles of capital investments in construction, of 48.6 and 12.3 percent more than that to be realized from the other variants during the next few years and also of 43.9 and 5.9 percent in the future.

Variant III calls for a capital-intensiveness, for increased pork production, of 32.9 and 11.4 percent less respectively than for the other variants in subsequent years. This variant differs favorably from the other variants in terms of the total amount of corrected expenditures per ton of increase in pork.

Table 2

Fixed Capital Requirements of Republic's Farms, millions of rubles

	Fixed Capital, total	Including				
		Buildings and Structures	Machines and Equipment	Productive Animals	Transport	Other Capital
		Variant I				
Fixed capital requirements at end of current period (5-6 years)	965	759	73	104	19	10
The same for end of subsequent period	1240	976	94	134	25	11
		Variant II				
Fixed capital requirements at end of current period (5-6 years)	911	716	69	98	19	9
The same for end of subsequent period	1587	1247	121	171	32	16
		Variant III				
Fixed capital requirements at end of current period (5-6 years)	965	759	73	104	19	10
The same for end of subsequent period	1932	1518	147	208	39	20

In order to carry out the conversion of swine raising operations over to an industrial basis in a timely and complete manner, a number of organizational-economic measures aimed at further developing the branch's material and technical base must be implemented. In the Belorussian SSR, a reduction in the estimated cost of construction can best be achieved by improving the livestock maintenance technology, by reducing costs for the construction structures and planning solutions and also by achieving the best disposition for the installations. According to data supplied by the Belgiprosel'khoz [Belorussian State Institute for Agricultural Planning], a reduction of 8 percent in the cost of construction can be achieved merely by improving the space-planning solutions, making greater use of economic types of buildings, observing the norms for technological planning in a very strict manner and by not tolerating excesses in the erection of the principal and auxiliary buildings.

The plans for buildings and installations should call for an increase in the proportionate cost of equipment, which is associated to a considerable degree with the expansion of work connected with the modernization of swine raising farms. Up until now, the modernized installations have not been supplied adequately with the required material and technical resources, particularly the needed technological, sanitary-technical and electrical engineering equipment. Nor has the production and delivery of non-standard equipment been organized.

In order to intensify economic analysis and achieve more complete validation of the principal trends for the further development of the material and technical base for swine raising, the information available on its status and on the possibilities for utilizing the available fixed capital in the future should be expanded and systematized. The following information should be known: the total amount of fixed capital, the degree of its wear and tear, the years that the production buildings were placed in operation and the dimensions of the farms. This will make it possible to compute more correctly the required amounts of farm expansion and modernization and the volumes of the proposed retirement and replacement of fixed capital, while taking into account the intensification of production specialization.

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MORE ATTENTION TO AGRICULTURAL LAND UTILIZATION IN CENTRAL ASIA URGED

Ashkhabad PROBLEMY OSVOYENIYA PUSTYN' in Russian No 6, 1980 received 20 Aug 80 pp 11-16

/Article by A. Ye. Mal'tsev, Council for the Coordination of Scientific Activity of the Academies of Sciences of the Union Republics of the USSR Academy of Sciences: "Agricultural Utilization of Land Resources of Central Asia"/

/Text/ The republics of Central Asia now face big tasks connected with an increase in the production of all agricultural products, whose accomplishment largely depends on an efficient utilization of land resources.

The territory of Central Asia is divided into a plain and a mountain territory. Agricultural production in these regions differs considerably. Oasis-type irrigated farming forms the basis for production on plains. Sown areas are located mainly in alluvial and piedmont plains. The production of industrial, grain and fodder crops is concentrated in these regions. Plains are also the country's major animal husbandry base. About 90 percent of the all-Union procurements of cotton and karakul, 30 percent of the procurements of mutton and 20 percent of the procurements of wool are obtained there.

Dry farming and animal husbandry form the basis for agricultural production in mountain regions. At an altitude of 500 to 1,000 meters irrigated farming gradually changes into dry farming. On nonirrigated areas mainly grain and fodder crops are produced and unoccupied land is utilized as spring and summer pastures. A mountain animal husbandry area, where highly productive summer pastures are widespread, is located higher.

In the availability of land resources suitable for agricultural utilization this territory is one of our country's richest regions. About 90 million hectares out of a total area of 127.7 million hectares are utilized by agricultural enterprises and farms. According to the data of the USSR Central Statistical Administration, the area of direct agricultural land is 70.5 million hectares (table 1) /5/.

However, the main land areas are utilized there as pastures, where transhumance farming is developed. Direct agricultural land (arable land) occupies about 6 percent of the territory. Cotton growing, grain and fodder production and other sectors of farming are developed there.

Table 1. Total Area of Agricultural Land in 1978, Million Hectares

Republic	Total land area (territory)	Land area in use	Agricultural land in use	Including: Total area of arable land	Including: Irrigated area
Uzbek SSR	44.8	32.9	26.2	3.9	3.304
Kirghiz SSR	19.8	16.0	10.1	1.3	0.941
Tajik SSR	14.3	9.4	4.2	0.8	0.602
Turkmen SSR	48.8	31.6	30.0	0.9	0.892
Central Asia	127.7	89.9	70.5	6.9	5.739

In connection with the great diversity of terrain and climate the soil cover is very variegated in Central Asia.

On the basis of the data of the Council for the Study of Productive Forces Under the USSR State Planning Committee and Central Asian scientific research institutions the soil resources of the Central Asian republics can be represented in the following form. Within their total territory amounting to 127.7 million hectares the soil of desert plains occupies 72.1 million hectares (57 percent of the total area), the soil of the desert-steppe piedmont belt, 15.1 million hectares (12 percent of the total area) and the soil of mountain regions, 32.4 million hectares (25 percent of the total area). The remaining part of the territory is occupied by glaciers, firn basins and a body of water /4/.

A low content of humus, insignificant thickness of soil horizons, considerable accumulation of gypsum in the lower part of the soil section, salinity, alkalinity and weak weathering of soil forming rocks are the characteristic features of the soil of desert plains. Sandy desert soil is widespread there.

Grey-brown soil is widespread in the elevated plains and foothills of Central Asia. The content of humus in it is 0.3 to 0.7 percent and of nitrogen, 0.04 to 0.07 percent. It was formed in many regions of Ustyurt, Kyzylkum and Karakum.

Differently saline takyr-like soil occupies sizable areas in alluvial plains. It is widely represented in the Amu-Dar'ya, Tedzhen and Murgab oases, as well as in the plains of the Syr-Dar'ya.

Takyr, which is semihydromorphic desert soil, is formed in flat plains composed of clay or loamy rocks.

Hydromorphous soil is formed in water-logged regions. It includes meadow, meadow-bog and bog soil, as well as solonchak. It is formed during a close stand of ground water and, usually, is widespread in river valleys. Meadow soil is formed when ground water is 1 to 2 meters deep and bog soil, up to 1 meter. Hydromorphous soil often has a different degree of chloride and sulfate salinization.

Grey soil is developed in piedmont regions. It extends in a belt at the foot of the mountain systems of Central Asia from Ashkhabad to Alma-Ata, separating the sandy deserts and plains of Central Asia from its mountain territory proper. The altitude position of grey soil varies from 200-400 meters above sea level to

1,200-1,600 meters. The section of grey soil is more developed and differentiated as compared with desert soil. The content of humus in the upper horizon is from 1 to 3.5 percent (light, typical or dark grey soil).

Cinammonic soil is developed in mountain regions. The humus horizon is dark-grey with a cinammonic shade and has a lumpy-granular structure. This type of soil is widespread at altitudes from 1,300-1,500 to 2,500-3,000 meters.

Meadow-steppe soil is widely represented in the sub-Alpine belt. It is commonly called brown and is divided into two types, that is, brown--with more humus (over 6 percent)--and light-brown--with less than 6 percent of humus. The former is widespread on moister slopes and the latter, on drier slopes.

The Zarafshan and Fergana valleys and the Bukhara and Tashkent oases are the oldest regions of irrigated farming. The grey soil developed there changed the composition and structure and strata of cultivated soil, sometimes reaching a depth of 1.5 meters, distinguished by a large reserve of humus and nutrient substances were formed.

The utilization of land resources in agricultural production raises the problem of their protection and reproduction. Work in this direction is carried out on a large scale. The set of measures envisages the application of fertilizers, watering and erosion and salinization control.

The application of fertilizers is widely practised on the entire territory of Central Asia, as a result of which harvests have increased considerably.

In Central Asia more than 2 million hectares of land are saline. As a result of this, a significant amount of cotton is not picked. An active fight against salinization has been waged in the last few years. Instead of open horizontal drainage, which is less effective and occupies up to 15 percent of the field area, closed horizontal or vertical drainage is used.

Wind and irrigation erosion does great damage to agricultural production. Its control includes the planting of tree and shrub vegetation around fields, roads and irrigation canals. The felling of forest and shrub plantings is forbidden, sand reinforcing vegetation is sown, various protective structures are built and overdeep plowing is carried out. Basically, irrigation erosion depends on an incorrect supply of water. Therefore, methods of irrigation without the washout of the soil horizon are developed.

The natural conditions of the plains and piedmont regions of Central Asia make it possible to obtain agricultural output only on irrigated land. The basic land areas utilized for irrigated farming are located in alluvial and piedmont plains (more than 80 percent) up to an approximate height of 1,000 meters.

About one-half of all the irrigated land is occupied by areas sown with cotton (2,788,000 hectares in 1978) and the second half, with fodder crops (1,213,600 hectares) and grain crops--basically, wheat, corn and rice (829,000 hectares). The remaining areas are occupied by sugar beets (about 50,000 hectares), hayfields and pastures, as well as by orchards and vineyards.

An increase in the yield of crops is an important task of the agricultural utilization of irrigated land. From 1913 through 1978 the yield of cotton almost tripled (from 10.8 to 27-28 quintals per hectare). The task of attaining an average harvest of 30 to 35 quintals per hectare for all Central Asia is set. On advanced farms such a harvest is also gathered at present. The task of increasing the yield of grain crops is also set urgently. A total of 15 to 22 quintals per hectare have been obtained there in the last few years.

A significant expansion of irrigated land is envisaged. The estimates made in the last few years show that in Central Asia there are approximately 12 million hectares of land suitable for development in irrigated farming. However, the shortage of water resources hampers its development.

In the mountain regions of Central Asia there are significant reserves of land suitable for development in dry farming. At present there are about 8 million hectares of such land, of which only 1.2 to 1.8 million are cultivated. The reserves of nonirrigated land make it possible to double or triple the area of arable land.

The regions of dry farming are characterized by distinctive natural conditions. They have a sufficient amount of heat and the precipitation is more than the minimum needed for the growing of agricultural crops (no less than 250 mm). Its basic amount occurs in winter. On the average, the frost free period ranges from 200 to 270 days a year. In natural conditions nonirrigated land is divided into provided and unprovided. Sometimes semiprovided nonirrigated land is also singled out.

Unprovided nonirrigated land is the area where there is up to 400 mm of precipitation and provided nonirrigated land, where there is more. Of course, this division is conventional. Nevertheless, the set of crops produced in various zones of nonirrigated land is different.

The soil cover formed on nonirrigated land also differs in zones. Grey soil--light and dark--is usually widespread on the plots of unprovided nonirrigated land. Provided nonirrigated land has cinammonic and light- and dark-chestnut soil and in some cases even chernozem (in the Issyk-Kul' basin).

Nonirrigated land (suitable for arable areas) is used for the cultivation of grain and fodder crops. Part of it is pasture and hayfield land. There are more than 13 million hectares of land that can be utilized as pastures and about 4 million hectares, as hayfields.

The basic areas sown with grain crops are located on land with marks of 500 to 800 meters. However, the harvests are low there--4 to 5 quintals per hectare (without irrigation).

Intensification of nonirrigated farming can be attained through some change in the general structure. The development of a major portion of nonirrigated land with an annual precipitation below 300 mm for irrigated farming could be one of the ways. Without irrigation the harvests of grain crops are low even during the most favorable years. It is advisable to develop farming on nonirrigated mountain land (900 to 2,000 meters), where, for example, in Uzbekistan, grain crops now occupy only 10 to 20 percent of the area. The natural conditions of these regions are favorable for the production of grain crops, the amount of precipitation is 400 to 700 mm and the harvests are stable and high.

Nonirrigated land in Central Asia is also utilized for the production of fodder crops. On some plots artificial pastures are created and lucerne, sainfoin, wheat grass and so forth are sown. Lucerne is the most valuable crop in fodder production. Its harvest is 50 to 80 quintals of green mass and 12 to 30 quintals of dry mass per hectare. Three crops can be obtained during wet years. Sugar beets for fodder for livestock, stock melons, watermelons and so forth are sown on nonirrigated land in some regions.

As already noted, pastures occupy a large portion of the land resources of Central Asia. In plains they are divided into pastures of sand, clay and gypsum deserts and river valleys. These pastures are suitable for utilization all year round and produce the cheapest fodder. However, their productivity is low--1 to 3 quintals per hectare (table 2).

Table 2. Total Areas of Pastures and Hayfields in 1978, Million Hectares

Republic	Agricultural land in use	Total area of pastures	Hayfields
Uzbek SSR	26.2	21.8	0.1
Kirghiz SSR	10.1	8.5	0.2
Tajik SSR	4.2	3.3	-
Turkmen SSR	30.0	28.9	-
Total	70.5	62.5	0.3

Desert pastures are suitable for sheep, camel and to a lesser extent horse breeding and large-horned cattle.

Usually, white and black saxaul, saltwort, old erythronium, ephemerons and ephemeroids--"ilak" and "azatis"--are widespread and wormwood, "singren" and sedge are found on sand. The productivity of pastures is 0.6 to 2.3 quintals per hectare there. Wormwood-saltwort pastures with the same capacity as on sand are common on gypsum desert plots. Clay desert pastures have a slightly higher capacity, that is, 0.8 to 4.2 quintals per hectare.

In mountain regions there are pastures in all altitude belts except for the nival zone. In area they are greatly inferior to plain pastures. However, their productivity is 2 to 2.5 times higher, on the average. Therefore, they play an important role in the development of animal husbandry in Central Asia. During summer and late spring periods livestock is driven to the adyry zone and then gradually to pastures located in upland regions, where sometimes they are kept for the entire summer season. Part of the livestock is driven to highly productive high-mountain pastures. However, these pastures are not sufficient for the placement of all the stock.

The total area of mountain pastures in Central Asia is more than 18 million hectares, of which more than 2 million hectares are in the Kirghiz SSR, about 3 million hectares, in the Tajik SSR, approximately 6 million hectares, in the Uzbek SSR and 1.1 million hectares, in the Turkmen SSR.

Pastures in altitude belts differ in the nature of vegetation and its utilization.

In piedmont regions in the adyry zone (up to 500-1,000 meters) they can be utilized in early spring and fall. On some plots there is little snow and livestock can also be kept there in wintertime. Basically, vegetation is ephemeroid--"karailak" and "kartych" (bulbous meadow grass)--there are many ephemerons--brome grasses, Malcolmia, "arpagany," milk vetch and goatgrass--and the average annual harvests of dry edible mass are 1.5 to 3.1 quintals per hectare. During favorable years the yield is doubled and during drought years it comprises approximately 60 percent of the average yield.

Higher, in upland regions with marks of 800-1,000 meters and up to 2,000-2,500 meters, the grass cover is represented by the grass family--meadow and awnless brome grass--pod bearing plants--vetch and sainfoin--and mixed herbs. The average annual harvests rise, ranging from 3 to 8 quintals per hectare. Fodder procurement is possible there. Basically, pastures can be utilized in spring and fall.

Only summer pastures--watershed upland and intermontane valleys--are located in high-mountain regions. The bulk of the livestock can be grazed there in 1½ to 2½ summer months. Usually, the snow cover is also not very thick and part of the livestock can be kept there all year round. Basically, pod bearing plants, the parsley family, the grass family and mixed herbs form the grass cover. The average annual harvests of dry edible mass are 5 to 10 quintals per hectare.

The low productivity of pasture areas in plains requires their improvement. Perennial grass, fodder crops and various shrubs and subshrubs are sown on pastures. In mountain regions pastures are usually infested with harmful inedible plants and fragmental products are subject to the effect of erosion. Their clearing and the destruction of weedy grasses and shrubs produce a big effect. Improvement is based on the plowing and destruction of sod with a subsequent creation of sown grass stands. If these artificial pastures are irrigated, the yield increases sharply to 20 and sometimes to 40 or 50 quintals of hay per hectare.

Conclusions

1. Central Asia is a region with big land resources. Approximately 70 percent of the total area of the territory has now been drawn into agricultural turnover. The basic land areas are used as pastures for livestock. Arable land occupies approximately 60 percent of the area of the territory and is utilized in irrigated and nonirrigated farming.

2. Irrigated farming is widespread in alluvial and piedmont plains, where areas sown with industrial, grain and fodder crops are concentrated. From 1972 to 1978 the area of irrigated land increased by 0.8 million hectares.

3. Nonirrigated farming is possible only in mountain regions. The reserves of unoccupied land suitable for utilization in nonirrigated farming total more than 6.5 million hectares. An intensified utilization of nonirrigated mountain land with average marks of 900 to 2,000 meters and natural conditions favorable for the production of grain and fodder crops can be one of the ways of developing farming.

The low productivity of pastures in plains necessitates their improvement through the sowing of perennial grass, fodder crops and shrubs and the creation of artificial pastures.

4. Highly productive pastures in mountain regions often require clearing, the destruction of harmful vegetation, the creation of sown grass stands and irrigation.

More attention to the agricultural utilization of land resources will make it possible to greatly increase the production of crop and livestock products there.

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AGRO-ECONOMICS AND ORGANIZATION

CHANGES INTRODUCED IN WAGE, BONUS SYSTEM FOR SOVKHOZ WORKERS

Minsk SEL'SKAYA GAZETA in Russian 8 Apr 81 p 2

/Article by Ye. Shevchuk, chief of the Administration for Organization, Standardization and Remuneration of Labor of the Belorussian SSR Ministry of Agriculture: "The End Result Is the Chief Thing"/

/Text/ At all the stages of construction in rural areas the party and the government constantly paid attention to problems of improvement in economic incentives for agricultural production. A number of measures for an increase in the wages of rural workers were implemented after the March (1965) Plenum of the CPSU Central Committee. As a result, in 1980 as compared with 1970 the average monthly wages of sovkhoz workers increased by 63.2 percent and the wages of kolkhoz members, by 83.4 percent. At the same time, practice showed that the previous wage and bonus system did not always create the necessary growth of labor productivity and profit. These deficiencies and the need to improve economic relations within the framework of the agroindustrial complex were discussed at the July (1978) and October (1980) plenums of the Central Committee of the party.

At the end of 1980 the CPSU Central Committee and the USSR Council of Ministers adopted the decree "On Improving the Planning of and Economic Incentives for the Production and Procurements of Agricultural Products." It envisages significant changes in wage and bonus terms for workers of sovkhozes and other state agricultural enterprises.

The job-contract-plus-bonus and the piece-rate-wage-plus-bonus systems are now used in plant growing. They will also be retained in the future, but with some supplements. For example, previously, under the piece-rate-wage-plus-bonus system the amount of a worker's earnings depended only on the volume of performed work. In the final calculation he was credited with 1.25 percent of additional payment per percent of plan fulfillment above 80 and up to 100 percent of the actual fulfillment. This means that the greater the wage expenditure, the higher was the amount of additional payments. This system stimulated, as it were, the overexpenditure of the wage fund. According to the new statute wages will be paid partially for the volume of performed work and, furthermore, for the obtained output according to rates. This will stimulate production growth to a greater extent. For example, it was also established that for workers employed in plant growing and animal husbandry, who attained higher indicators in the growth of yield and in the productivity of livestock and poultry, the amount of additional payments could be increased from 25 to 50 percent of the wage fund. This will make it possible to greatly increase the earnings of those who attain high end results year after year.

The wages of machine operators participating in fodder procurement are increased. Their wages are equated with those of tractor and machine operators employed in the harvesting of grain crops, corn, potatoes and grass seeds. The titles "master of plant growing 1st class" and "master of plant growing 2d class" with an additional payment of 20 and 10 percent respectively are given to the best workers performing manual horse operations.

The rights of sovkhoz directors in the selection of indicators for the payment of bonuses to workers have been extended. They are allowed, in coordination with the trade-union committee and with the permission of superior bodies, to develop such indicators with due regard for specific production conditions.

The rights of brigade collectives in the determination of the amounts of bonuses and increments have been extended. Brigade councils have been given the right to establish an amount of bonus for every member of the collective with due regard for his contribution to the common cause, to recommend workers for incentives in the form of increments and additional payments for occupational skills and holding two jobs and to determine the winners in the competition within a brigade and the amounts of their incentives.

To increase the interest of collectives in labor productivity growth and to reduce labor turnover, sovkhozes and other state enterprises and associations have been granted the right to pay, from wage fund savings, wage rate and salary increments; to workers--for holding two jobs and performing the established volume of work with a smaller number of people--up to 50 percent of the wage rate or salary, to engineering and technical personnel--for high skills--up to 30 percent, and to agricultural specialists working as brigade leaders in plant growing and animal husbandry, up to 50 percent. These increments can be canceled if work indicators are lowered.

The bonus system for managers and specialists has been revised considerably. Instead of the indicator for the payment of bonuses for the overfulfillment of the sales plan, the payment of bonuses for every percent of increase in the volume of sales (production) as compared with the average annual level attained during the preceding 5 years is introduced. This will make it possible to interest them to a greater extent in an increase in the production of agricultural products. Bonuses will be paid for the obtained increase in profit, as well as for the derivation of profit. On unprofitable sovkhozes bonuses will be paid for a decrease in the loss as compared with its average annual amount in the last 5 years on condition that output increases as compared with the same period. This will contribute to an increase in earnings, especially on medium-size and economically weak farms.

The wages of managers and specialists on sovkhozes that have attained high indicators, but where the possibilities for obtaining an increase in output are somewhat limited, will not be lowered. For retaining the attained level managers of such farms will be paid bonuses amounting to two salaries annually. Managers and specialists on such sovkhozes will also be able to obtain bonuses (up to two salaries annually) for the derivation of profit.

Changes have also been introduced in the terms under which a bonus will be paid. It was established that a bonus will be paid to managers and specialists for an increase in the volume of sales (production) provided the plan for grain and meat production and on specialized farms, in addition to this, for the output of the basic sector is fulfilled. If the established plan is not fulfilled, these bonuses can be paid in exceptional cases with the permission of superior bodies at the rate of no more than 50 percent of the established amounts.

For the purpose of increasing the financial interest of managers and specialists in the further growth of output, the republic's Council of Ministers was allowed to raise their salaries by 10 to 15 percent on the sovkhozes where the volume of sales of output exceeds by 50 percent and more the volume of its sales envisaged for the first group of sovkhozes in terms of wages.

The procedure of formation of the material incentive fund has been changed fundamentally. Previously, its size did not depend on the growth of output. Now it has been made directly dependent on a rise in this indicator. Furthermore, the material incentive fund will now be formed according to stable rates.

To be sure, the introduction of new financial incentive terms into practice will contribute to a successful accomplishment of the tasks for an increase in the production and improvement in the quality of products and for a more efficient utilization of land and labor and material resources.

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AGRO-ECONOMICS AND ORGANIZATION

PLANNING DEFICIENCIES IN INTERFARM COOPERATION CITED

Moscow EKONOMICHESKAYA GAZETA in Russian No 7, Feb 81 p 18

/Article by V. Prosin, chief of the Main Administration for Interfarm Cooperation and Agroindustrial Integration of Sovkhoz and Kolkhoz Production: "With Smaller Expenditures of Labor and Funds"/

/Text/ The process of specialization and concentration of agricultural production at the present stage is characterized by the pooling of the funds and efforts of several farms for the purpose of establishing joint large-scale specialized production. The development of interfarm cooperation and agroindustrial integration creates objective conditions for a fuller utilization of the advantage of specialized production by all kolkhozes, sovkhozes and processing enterprises forming part of a cooperative.

That is why the specialization and concentration of agricultural production on an interfarm basis and agroindustrial integration are some of the most important components of the overall program for the development of productive forces and the social reorganization of rural areas and are considered the main trend in the development of agriculture at the present stage.

Existing Forms

At present interfarm cooperation encompasses many sectors of the rural economy, that is, production of products, seed breeding, construction, agrochemical reclamation and social-general services for kolkhozes and sovkhozes, and others. The number of various interfarm and agroindustrial formations in the system of agriculture at the beginning of 1980 was about 13,000, increasing more than 1.5-fold as compared with the beginning of the 10th Five-Year Plan.

The practical work of interfarm enterprises and production associations shows that, as a rule, labor productivity and the rates of production growth are much higher there than on kolkhozes and sovkhozes and production costs and material and labor expenditures per unit of output are lower.

For example, good results in the fattening of large-horned cattle were attained in Orenburgskaya Oblast. An interfarm fattening area, where the livestock of all farms is fattened, has been built in every rayon. The cost of a place for one animal averages 270 rubles, which is one-third or one-fourth of the cost in capital barns. On these areas in 2 years alone about 360,000 head of large-horned cattle were fattened and 78,000 tons of weight gain were obtained, which comprises 25 percent of its total production volume by the oblast's public sector. The average delivery weight of one head was 400 kg.

It is well known that the establishment of a firm fodder base is a decisive factor in the organization of the production of livestock products on an interfarm basis. For example, the Kolkhoz imeni Uritskiy in Gomel'skaya Oblast, which fattens the livestock of 17 kolkhozes--members of the cooperative--solved this problem correctly. Having transferred the plans for state purchases of plant products to other farms, the kolkhoz grows only fodder crops on its land, obtaining 50 to 60 quintals of fodder units per hectare. More than 7,000 head of livestock of an average weight of 445 kg, of which 96 percent have a higher degree of fatness, are annually sold to the state on account of the fulfillment of the plans of member farms. From the results of its activity the fattening enterprise receives 3 to 4 million rubles of profit, the bulk of which is transferred to the farms that are members of the cooperative. The other farms concentrate their efforts on the production of other types of products.

The establishment of different types of interfarm service enterprises is developing to an ever greater extent. This makes it possible to most skillfully perform a number of operations on kolkhozes and sovkhozes with minimal expenditures. In all there are about 2,000 such enterprises and organizations in the sphere of services for agriculture. They annually perform operations and provide various services worth almost 950 million rubles.

The utilization of agricultural equipment and its technical servicing are organized on an interfarm basis. For example, in Moldavia the established interfarm enterprises for mechanization and electrification perform 93 percent of all the mechanized operations, carry out irrigation on 70 percent of the area of irrigated land and apply 80 percent of organic and 70 percent of mineral fertilizers on the republic's kolkhozes. All agricultural measures are implemented by overall mechanized detachments in accordance with flow sheets and work schedules.

The concentration of equipment contributes to the shortening of the periods during which operations are performed, increase in the efficiency of utilization of machines and improvement in the quality of implemented agricultural engineering measures. Good results in the utilization of equipment were also attained by interfarm enterprises for mechanization in Krasnogvardeyskiy Rayon, Stavropol'skiy Kray.

From Production to the Consumer

Agroindustrial integration--unification of the production, processing, storage and sale of agricultural products--has been developed in the country in the last few years. For example, in Georgia there is an agrarian-industrial-trade association of the republic's Ministry of Agriculture, which operates according to the "field-store" principle. The association includes 64 sovkhozes, 6 department stores, 214 specialized stores, 115 pavilions, 4 canning plants, a storage facility of a capacity of 77,500 tons and 2 motor transport enterprises. Specialization and concentration, rise in the standard of farming, elimination of departmental barriers and reduction in the losses of products during their sale enabled the association to greatly increase the production and marketability of products. The association's proportion in the state purchases of the republic's public sector comprises 56 percent for vegetables and 45 percent for potatoes. Similar associations were established in Stavropol'skiy Kray, Kuybyshevskaya and Odesskaya oblasts and Checheno-Ingushetia.

For the purpose of pooling the efforts and coordinating the activity of agricultural, procurement, processing, supply and service enterprises and organizations located in one rayon, territorial rayon associations or agrarian-industrial associations are established. The first experience in their operations brings positive results. Vil'yandiskiy and Pyarnuskiy rayon agricultural associations in Estonia, the Abashskiy Rayon Association in Georgia and some others are examples of the activity of the mentioned formations.

At the same time, a study of the state of affairs in the localities shows that, along with the attained positive results, in this process there are still many deficiencies and unsolved problems.

There are still many examples when the relationships between interfarm enterprises and member farms are not built on a mutually advantageous cost accounting basis and nonequivalence of the exchange of the results of activity is allowed. This applies primarily to many farms of the RSFSR Skotoprom system.

In a number of RSFSR oblasts, in the Kazakh, Kirghiz, Uzbek and Moldavian SSR and in other republics, when some animal husbandry interfarm formations are established, the problems of their complete provision with fodder of their own production are not solved, specialized fodder producing farms on an interfarm basis are not established and contractual obligations of member farms for the delivery of fodder to interfarm enterprises are not fulfilled. The land areas available in interfarm formations producing livestock products are not fully utilized for fodder production.

Improvement Is Needed

The development of interfarm cooperation urgently requires an improvement in the mechanism of management and, primarily, a unification of the system of planning, financing and crediting. It is necessary to work out standard staffs and staff normatives for various formations on the basis of cooperation. In a number of cases, when new interfarm enterprises and production associations are established, an unjustified increase in the size of the managerial staff is allowed and the expenditures on its maintenance are increased.

The draft of the Basic Trends states that, for the purpose of a successful realization of the food program, it is necessary to ensure a unified planning, proportional and balanced development of the sectors of the agroindustrial complex, significant strengthening of its material and technical base, improvement in economic relations among sectors and organization of their efficient interaction for an increase in the production of agricultural products and improvement in their preservation, transportation, processing and delivery to the consumer.

The task is to preserve all the products produced and to deliver them to the consumer in the best form. Unfortunately, every year during the period of mass procurements of products, especially fruits and vegetables, often procurement organizations hold back or limit the acceptance of the perishable products delivered to them. Some of them do not find a market, lose their commodity appearance and sometimes are simply lost. In many respects transport organizations are also to blame for this. There were many difficulties with the sale of vegetables and melon crops in Moldavia and Astrakhanskaya and a number of other oblasts last year.

Agroindustrial integration affects the interests of enterprises and organizations of several ministries and departments and is of an interdepartmental nature. Therefore, it is very important to determine the economic and organizational relations at the interface of the transfer of the same products by enterprises and organizations of various production systems.

It seems advisable to work out the basic principles of the development of agroindustrial integration at the present stage, which affect the interests of both the enterprises producing agricultural products and the enterprises processing and selling them to the consumer.

At the same time, it is important to increase both the economic interest and responsibility of enterprises for the results of joint activity. The latter is especially important, because the nonfulfillment of obligations by one enterprise, as a rule, leads to significant losses. Apparently, in their organization associations of fruit, vegetable and viticultural specialization should be agrarian-industrial-trade associations with a developed base for the storage of products. Only with such a form of organization and management of production is it possible to ensure the deliveries of high-quality products to the consumer and to avoid their losses. The establishment of a Union-republic USSR Ministry of Fruit and Vegetable Farming with its local bodies will make it possible to solve this problem more quickly and successfully.

The need to solve a number of problems in interfarm cooperation and agroindustrial integration requires activization of work in this direction on the part of the appropriate ministries and departments, as well as economic science.

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AGRO-ECONOMICS AND ORGANIZATION

STRUCTURAL LINKS IN AGRO-INDUSTRIAL COMPLEX TO BE DEVELOPED

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[Article: "The Development of Structural Units of the Agro-Industrial Complex"]

[Text] The basic task of the agro-industrial complex is to reliably provide the country with foodstuffs and agricultural raw material.

From the the draft of the CPSU Central Committee to the 26th Party Congress, "Basic Directions for the Economic and Social Development of the USSR During 1981-1985 and the Period up to 1990."

The July (1978) Plenum of the CPSU Central Committee, following the course indicated by the 25th Party Congress, devoted special attention to the development and selection of the best organizational forms of inter-enterprise cooperation and agro-industrial integration. "We need not just any kinds of associations," emphasized Comrade L. I. Brezhnev, "but those which actually raise socialist collectivization of production and labor to a new level, are based on the latest achievements of science, technical equipment and technology, provide for the highest possible productivity and produce a maximum of inexpensive output."[1]

At the present time the creation of structural subdivisions of the agro-industrial sphere is directed toward to the development of existing production associations and their transformation into new structural subdivisions--specialized branch agro-industrial blocks of the national economic agro-industrial complex (APK). These units which fulfill technological and economic functions can be: production service for agriculture, agricultural production itself, transportation, processing, and the sales of prepared products.

Shortcomings in the existing structure of production units of the national economic APK consist primarily in the lack of a comprehensive system of incentives and a unified overall approach to the development of all subdivisions, beginning with production service for agriculture and ending with the sales of prepared products. In the present situation agricultural production is largely separated in practice from branches that provide means of production for it, material and technical service, repair and operation of technical equipment. As a result, agriculture as a consumer can not actively affect the development of these branches. Hence arise the difficulties in the assimilation and production of means of production in agriculture, material and technical service and operation of technical equipment. The same sort of situation is arising in relations between agriculture and the processing industry which leads to large losses of agricultural output.

Under the Eleventh Five-Year Plan special attention will be devoted to solving this most important national economic problem. In particular the draft of the CPSU Central Committee for the 26th Party Congress, "Basic Directions for the Economic and Social Development of the USSR in 1981-1985 and the Period up to 1990," has a special section which emphasizes: "For purposes of successful implementation of the food program, to provide for unified planning and proportional and balanced development of branches of the agro-industrial complex, a significant strengthening of its material and technical base, improvement of economic ties among branches, and organization of their efficient interaction for increasing the production of agricultural products and improving their storage, transportation, processing and delivery to the consumer."[2]

At the present time the structure of the production units of the national economic APK is just in the process of formation, and interfarm and agro-industrial enterprises of various types have still not formed a developed system. When such a system exists the APK is characterized not only by a certain functional-branch composition which includes agriculture, the production and sales infrastructure and the industry which processes agricultural raw material, but also a strengthening of the organic ties among these spheres at various economic levels, the development of an integrated system of specialized production units and the unity of their organizational and administrative structure. Thus we are speaking not about the development of specialized branches of agro-industrial enterprises and the formation of the national economic APK from the position of strengthening interbranch balance ties, but about the establishment, on the basis of the latter, of qualitatively new structural subdivisions that form a comprehensive system. In our opinion, this most important structural unit of the APK can be specialized branch food agro-industrial blocks (APB) that reflect the modern form of production in the agro-industrial sphere.

Branch food agro-industrial blocks are totalities of interconnected specialized industries, all spheres of the APK and elements of the infrastructure for obtaining and delivering to the consumer certain products of a particular assortment and quality. The food structure of the national economic APK can include the following specialized agro-industrial blocks: meat and dairy, sugar beet and sugar, oil and fat, potato processing, cotton, flax, wine and wine making, and several other units.

One of the main practical tasks will be to select the best organizational forms of the specialized food agro-industrial blocks at various levels of the APK with respect to various branches and areas of agriculture. At the present time in Moldavia, Estonia and several other republics and oblasts various directions have appeared in the formation of modern units in the agro-industrial sphere.

In Estonia the creation of specialized subdivisions of the APK consists in the formation of unified territorial-production associations for the kolkhozes, sovkhozes and processing and service enterprises located on the territory of the administrative region, regardless of their departmental jurisdiction. Within the framework of the latter there is specialization and concentration of production on the basis of economic and intrabranch specialization. The organizational and economic formation of the republic APK is carried out on the basis of the development of a system of territorial-production associations and a reformulation of the functions of agricultural and industrial ministries and departments. Such an approach to the organization of the system of agro-industrial productions and, on this basis, the development of a structurally unified regional APK is of great significance for efficiently combining branch and territorial principles of administration, effectively applying planning and economic levers for influencing enterprises of various departments, and orienting their activity towards the achievement of a high final result.

In Moldavia the development of a modern system of specialized food units of the regional APK is proceeding in stages and has certain peculiarities.

The first stage embraces the process of the creation of specialized enterprises for production service of agriculture and contributes to the transition to the second stage--to specialization of production on the kolkhozes and sovkhozes and the creation of a system of agrarian and agro-industrial enterprises and associations. The latter, transformed into a developed system of specialized branch agro-industrial blocks of the republic APK, laid the basis for the third stage in the development of modern forms of production in the agro-industrial sphere.

The specific features of the first stage (up to the 1970's) consisted in that the cooperating farms singled out one or two branches (capital construction, animal husbandry, feed production, feed processing) which in terms of production actually became independent, especially if specialized enterprises with a closed production cycle were created. Under these conditions the kolkhozes and sovkhozes had greater possibilities of specialization, but in fact they did not cooperate in their own production activity and did not create a system of specialized enterprises. This stage involved the formation of a system of units mainly in the sphere of production service for kolkhozes and sovkhozes, construction and the production of construction materials, repair of technical equipment, electrification and chemization of agriculture, care for land reclamation systems, and so forth.

The second stage in the development of structural units began after the 1970's. It meant increased cooperation of all production, contributing to specialization and industrialization of kolkhoz and sovkhoz business and the development of a system of specialized production enterprises and associations. In 1979 in Moldavia there were 200 of these specialized enterprises, complexes and associations functioning in animal husbandry alone. Interfarm animal husbandry formations provided for 51 percent of the poultry meat, 66 percent of the beef, 78 percent of the pork and 78 percent of the eggs produced in the kolkhoz cooperative sector.[3]

In addition to animal husbandry, interfarm cooperation and agro-industrial integration embraced such branches as crop growing, gardening, viniculture, tobacco growing, feed production, grain farming and the production of industrial crops. The concrete forms of this cooperation are inter-kolkhoz gardens and vineyards, associations for producing tobacco, interfarm crop rotation for raising vegetables, grain and sugar beets, and so forth. As a result, in 1978 more than 41 percent of the overall gross output of agriculture and industry in the republic's kolkhoz cooperative sector was produced on an interfarm production basis. The data in Table 1 show the rates of development of interfarm enterprises.

Table 1. The Development of Interfarm Enterprises in the Moldavian SSR

	1965	1970	1970 % of 1965	1975	1975 % of 1965	1978	1978 % of 1970
All interfarm enterprises with independent balances	51	113	222	176	345	311	275
Fixed capital of interfarm enterprises (at end of year), millions of rubles	30.8	154.7	5-fold	802.3	26-fold	1457	9.4-fold
Their proportion of fixed capital of kolkhoz sector,%	3.7	10.7	---	30.6	---	43.7	---
Number of workers employed at interfarm enterprises, thousands of people	25.3	44.3	175	99.4	393	137.2	310
Their proportion of number of workers of kolkhoz sector, %	3.5	6.5	---	15.8	---	24.1	---
Gross output of interfarm enterprises in gross output of kolkhoz sector,%	5.0	16.3	---	30.5	---	41.5	---
Profit realized by interfarm enterprises, in overall sum of profit of the kolkhoz sector, %	4.5	19.1	---	30.0	---	40.0	---

The peculiarity of this stage of the formation of a system of specialized units consists not in the parallel development of interfarm enterprises and kolkhoz-sovkhoz production, but in the transformation of the production base of the kolkhozes and sovkhozes into such a system. In this stage, because of the transformations that are taking place, more and more of the kolkhozes and sovkhozes themselves begin to fulfill functions of specialized interfarm enterprises. The advantage here consists in more complete accounting for the actual possibility and the specific features of the kolkhozes and sovkhozes. Prerequisites are created from the development of effective forms of interfarm cooperation on the basis of specialization not of individual enterprises, but of the entire basis of the kolkhozes and sovkhozes.

The development of cooperation of kolkhozes and sovkhozes in their main production activity is promising from the standpoint of the gradual establishment of production associations as single economic units. The cooperation of farms and the creation of a broad network of specialized enterprises of an industrial type on the basis of the transformation of production bases of kolkhozes and sovkhozes is a prerequisite for agro-industrial integration which signifies a changeover to the development of a system of agro-industrial enterprises and associations. The development of specialized branch units in the agro-industrial sphere of Moldavia is diverse: the joining of interconnected branches of agricultural and industrial production; the creation of agro-industrial enterprises and associations of an industrial type; the joining of specialized associations and transportation-sales organizations in order to place various aspects of a unified process in the service of the achievement of a final goal; and the development of industrial forms of cultivation and processing of crop growing and animal husbandry products directly in interfarm enterprises and associations.

The reason for combining interconnected branches of agricultural and industrial production into a unified national economic APK and transforming agriculture into an organic sphere of it is to strengthen ties between agriculture and industry. At the same time strengthening the dependency of agriculture on industry deepens economic ties among agricultural enterprises themselves, it gradually eliminates the multibranch nature of production on the kolkhozes and sovkhozes, and it destroys their industrial independence of one another. As a result new forms of production organization develop in the agro-industrial sphere.

The organic ties between agriculture and industry take form with the framework of large agro-industrial associations. One of these economic units is the agro-industrial association of an industrial type in fruit growing, for example, the Slobodzeyskiy Pamyat' Il'ichu Association. This association has 6,000 hectares of gardens, an automatic irrigation system, a packaging factory, refrigerator capacities of 80,000 tons, its own airport, and a fleet of 200 refrigerator trucks. Such agro-industrial garden associations will be created in 22 rayons of the republic.[4] At the present time the formation of these enterprises as agro-industrial associations is only beginning, since in the current stage they do not include industrial processing of the products. But large interfarm gardens and vineyards make it necessary in the future to combine production, processing and sales of prepared products.

Another direction for the establishment of a system of specialized units in the agro-industrial sphere is the development of industrial forms of production and processing of products directly in the interfarm gardens, vineyards, vegetable crop rotations, animal husbandry complexes and other interfarm enterprises. For example, interfarm specialized enterprises are constructing asphalt transhipment areas for storing corn and for completing the processing of the ears on the threshing floor, constructing large mechanized threshing floors for completing the processing, drying and storing corn with subsequent processing into mixed feed.

An important criterion for the development of a system of specialized forms of production is to subordinate various aspects of the unified process of agro-industrial production to the achievement of the final goal. A condition for ensuring this subordination is the combination of agro-industrial enterprises with transportation and sales organizations and the creation of a unified organizational and technical chain of production--transportation, storage, processing and sales of products. In the Moldavian SSR these forms of production are: the Moldvinprom agro-industrial association for viniculture and winemaking; Moldplodoovoshchprom--for production, procurements, industrial processing and sales of vegetables and fruits;

Modefirmasloprom--for oil bearing crops and oils; the system of specialized scientific production associations, and so forth.

The data in Table 2 show the dynamics of the development of agro-industrial forms of production in Moldavia.

One of the more developed modern agro-industrial forms of production is the union-republic Moldploovoshehprom Association. Its structure consists of one scientific production association, 181 sovkhoz-plants that belong to 19 agro-industrial associations, a wine and cognac association, 15 plants for primary and secondary wine making, two automotive bases and so forth--a total of more than 200 enterprises and associations. In 1978, despite the unfavorable climatic conditions of a number of years, the associations' grape production increased 1.9-fold as compared to 1971. Deepening production specialization made it possible to introduce progressive technology for the cultivation of grapes, to raise the level of mechanization, to increase productivity by 28 percent as compared to two sovkhozes of other systems, to work out the interconnections among production, transportation and processing, and to reduce products losses. The Moldploovoshehprom agro-industrial association is also functioning effectively.

The system of branch associations functions mainly in the state sector of the republic. The third stage of the development of a regional APK has now begun in Moldavia. It consists in transforming production associations of the state and kolkhoz sectors into a unified system of specialized state-kolkhoz branch agro-industrial blocks of the regional APK. The existing food agro-industrial associations, Moldvinprom, Moldploovoshehprom, Kolkhozzhivprom, Moldtabakprom, and Moldefirmasloprom have not become real food blocks of the APK. The fact is that the constituent parts of each food agro-industrial block of the republic are only beginning to eliminate the dispersion of the process of public production of agricultural products which is unified by nature. In the first place the existing organizational forms remain separated subsystems of various ministries, departments and sectors (state or kolkhoz) of the economy. In the second place not every one of these forms was created for achieving a single technological and economic goal, beginning with production and ending with the sale of agricultural products. As a result, even within the framework of new forms of agro-industrial production, there is a violation of the unity of natural, technological, economic and social ties.

Deepening of specialization and concentration of production on the basis of extensive development of agrarian and agro-industrial associations presupposes the transformation of existing forms of interbranch ties and the changeover to a new system of economic units. For example, in fruit growing in the republic there is deep specialization of production. On the basis of the Kordu scientific-production association industrial technology for raising plant material is being developed, perfected and introduced, and new, highly productive strains are being used. Large interfarm orchards of 4,000-6,000 hectares are being created. The kolkhozes themselves are specializing in the production of fruits. In such cases the development of agro-industrial enterprises is a progressive process.

But more than 90 percent of the fruits in the public sector are produced in the system of the council of kolkhozes which does not have a processing base. Under

Table 2. The Development of Agro-Industrial Formations in the Moldavian SSR

	1971	1975	1975 % of 1971	1978	1978 % of 1971
Number of sovkhoz-plants and sovkhozes included in agro-industrial associations	158	171	108	245	155
Area of agricultural land, thousands of hectares	378	387	102	475	126
Proportion in areas of agricultural land of the kolkhoz and the state sector, %	151.1	15.8	--	19.5	--
Fixed capital for agricultural purposes (at end of year), millions of rubles	368	730	198	1,084	294
Proportion of fixed capital for agricultural purposes from kolkhoz and state sector, %	17.8	21.0	---	23.4	---
Gross agricultural output, millions of rubles	278	337	121	418	150
Proportion of gross output from public sector, %	14.8	16.4	---	19.1	---
Number of agricultural workers in associations, thousands of people	104	130	125	155	149
Proportion of numbers of agricultural workers, %	15.0	18.2	---	23.2	---
Fixed industrial production capital (at end of year), millions of rubles	259	548	212	726	280
Proportion of fixed capital of all industry, %	17.1	19.7	---	19.8	---
Gross industrial output, millions of rubles	1,210	1,457	120	1,744	144
Proportion of all output of food industry, %	56.4	55.0	---	63.0	---
Number of industrial production personnel, thousands	36.3	37.6	104	39.0	107
Proportion of number of workers in all republic industry, %	16.3	14.5	---	10.6	---
Capital investments in industrial enterprises, millions of rubles	38.7	41.4	107	59.7	154
Capital investments in agricultural enterprises, millions of rubles	75.6	131.5	174	211.8	280

these conditions it is not always possible to arrange efficient, synchronized work for the delivery and processing of fruits. The situation is the same with respect to supplying the farms with planting materials of fruit crops, which are produced in the system of the republic Ministry of Agriculture. The situation is similar in vegetable production. More than 80 percent of them are raised in the cooperative-kolkhoz sector. But the processing and trade enterprises are under the jurisdiction of a different department. This is reflected in the quality of the deliveries and processing of products, not to mention losses during shipment in unspecialized transportation. The ties for production, transportation and processing of fruits and vegetables remain separated even though the rates of interfarm cooperation and agro-industrial integration are increasing in these branches. There is no doubt that the tendency toward specialization, cooperation and concentration of production in combination with industrialization creates a need for the formation of a single state-kolkhoz unit for producing, procuring, processing and selling fruits and vegetables. This is promoted by having the same production technology and the same problems in cultivation, transportation and processing, regardless of the form of property or the department to which one enterprise or another belongs.

The organizational and economic coordination of the new units can be carried out of on the basis of existing union-republic state Moldploovoshehprom association, which can then be joined to interconnected subdivisions and the kolkhoz sector. Within the framework of such an association one can create more favorable conditions for developing the process of integration, overcoming departmental separation and equalizing the levels of concentration of industrial and agricultural productions on the basis of their cooperation and the creation of intermediate production for processing perishable raw material. All this leads to further development of planning, a reduction of the quantity of primary economically separated units, and the surmounting of organizational separation.

Similar problems arise in viniculture as well. At the present time the unified economic and technological chain for producing planting material, isolating new strains of grapes, cultivating them, harvesting them, transporting them and processing the final product are dispersed among various ministries and departments: the Viyerul scientific production association of the Ministry of Agriculture, Moldvinprom, the council of kolkhozes and so forth. And the rates of interfarm cooperation in viniculture are constantly increasing. The situation is also similar in the area of material and technical supply, operation, repair and adjustment of technical equipment, and production service for grape growers. All these are carried out in relative isolation by various ministries and departments. These conditions hold back the implementation of a unified technical and economic policy for production service for grape growers and for industrial transformation of the given branch as a whole.

The processes of integration and interfarm cooperation can be [illegible] deepened in new economic forms on the basis of a unified technological process for grape production. The organizational and economic connection of the new units can be carried out on the basis of the existing republic state agro-industrial association (APO), Moldvinprom, which can then be joined to interconnected subdivisions of the kolkhoz sector. The state-kolkhoz APB Moldvinprom of the republic APK could include: the Vierul scientific production association of the Moldavian SSR Ministry of Agriculture, the Vinogradprom association of the council of kolkhozes and Moldvinprom of the state sector as well as trade and sales organizations. Within the framework of such an APB one can more effectively resolve problems of serving the branch (supply, repair, operation of technical equipment, increasing its efficiency, and so forth), production of products, transportation of grapes and their processing.

Branch specialization of production on kolkhozes and sovkhozes and the creation of a system of interbranch enterprises and associations in crop growing prepare conditions for agro-industrial integration for other kinds of products as well. In the future it will be expedient to create a unified state-kolkhoz APB on the scale of the republic for production, procurements and processing of grain crops, sugar beets and sunflowers, which could combine the Selektsiya and Gibrid NPO's of the Moldavian Ministry of Agriculture, interfarm enterprises of the council of kolkhozes, enterprises for completing processing, drying and subsequent processing of the Ministry of Procurements and enterprises that process sugar beets and sunflower seeds as well as the republic Ministry of the Food Industry. Within the framework of such an APB it would be possible to solve more easily problems of combining agricultural and processing branches.

Problems of developing agro-industrial integration and, consequently, developing structural units in the agro-industrial sphere arise in animal husbandry as well. With its intensive changeover to an industrial basis and the development of agro-industrial ties there arises a need to provide for close cooperation and further integration of processing enterprises with farms that supply the products.

At the present time the unity of the process of producing animal husbandry products --raising cattle and hogs for breeding, reproduction, completion of raising, fattening of cattle and hogs, processing of meat--is violated because the various stages are under the jurisdiction of various ministries and departments. Another factor that impedes agro-industrial integration in the area of animal husbandry in Moldavia is objective and consists in the various levels of concentration of the production of animal husbandry products and their processing. But this factor can be surmounted on the basis of cooperation of rayon associations of Kolkhozzhivprom with one industrial enterprise or through the creation of slaughtering shops within the framework of the Kolkhozzhivprom system. It seems expedient in the future to create a unified state-kolkhoz APB, Moldzhivprom. It could combine the specialized NPO's Progress i Zarya of the Moldavian Ministry of Agriculture, enterprises for producing pork, beef, milk and poultry meat of the Kolkhozzhivprom system, and also the state-kolkhoz mixed feed industry. These associations can be formed on the basis of specialized agro-industrial enterprises. Within the framework of the latter, on the basis of their cooperation, it would be useful to create slaughtering shops at complexes and to develop enterprises for producing and processing feeds. When a high level of concentration is achieved, the APO's could be integrated with meat combines in keeping with the corresponding territorial principle. Specialized branch state-kolkhoz APB's should be unified cost accounting [khozraschet]. In this stage it is expedient to carry out the organizational-economic intercoordination of subdivisions within the block through combining cost accounting [khozrachet] and administrative principles, on the basis of retaining the operational-economic and legal independence of the subdivisions that comprise the association. The main cost accounting [khozraschet] units within the framework of specialized branch APB's could be local-territorial agro-industrial associations. Within the latter one could form primary cost accounting [khozraschet], interfarm and agro-industrial enterprises, associations (sovkhozes, kolkhozes, interfarm orchards, vineyards and their processing shops, enterprises for producing feeds, and specialized kolkhozes, sovkhozes and service enterprises) which would also be the initial forms of interfarm cooperation and agro-industrial integration. In order to increase the efficiency and quality of the work in the APB's it is expedient to change the organization of procurements, production service and material-technical supply over to cost accounting [khozraschet].

As the specialized blocks take form and become stronger it will be necessary to change over to the development of direct ties among production associations of the first sphere and APB's and the transformation of the existing system for the sales of means of production through the Goskomsel'khoztekhnika. At the present time it is an intermediate unit between the spheres of the APK and it actually disrupts the organic nature of the technological chain among them. The establishment and development of APB's in this area leads not only to changes in production administration and forms of organization of productive forces in the agro-industrial sphere, but also to the development of changes and improvements in production relations within the system of the agro-industrial complex. This is very important for on the level of the blocks and their production associations it becomes possible to concentrate the problems of planning procurements and the direction of specialization and concentration of production, products sales, credit, material and technical supply, and the creation of a reserve specialized production association for mechanization, land reclamation and electrification of production. It also becomes possible to concentrate differential rent in the APB's and to use it for motivating its subdivisions to produce the complex's final product. Local enterprises can solve problems of detailed organization of production, its detailed structure, the distribution of funds remaining at its disposal, and so forth. Under modern conditions it is expedient to leave a considerable proportion of the net income from economic activity so that it can be utilized by the enterprises.

Within the framework of state-kolkhoz specialized branch APB's favorable conditions arise for changing over to the development of all encompassing plans, beginning with production service for agriculture and ending with the sale of the final products, with a separation of the areas for their utilization. Moreover, it becomes possible to submit firm procurement plans not only to individual enterprises and associations, but also for the branch APB as a whole, while at the same time limiting the number of natural indicators that determine the association's production specialization. This increases the role of production, interfarm and agro-industrial associations in deepening specialization and in increasing the concentration of production. Finally, prerequisites are created for developing unified criteria for the establishment of procurement plans, taking all production factors into account (economic evaluation of the land, the condition of production capital, and so forth). The development of state-kolkhoz branch APB's presupposes the changeover to a unified system of motivating kolkhozes, sovkhozes and interfarm enterprises on the basis of equalizing procurement prices, improving their ratios for various kinds of products and utilizing rent payments that correspond to the quality of the land.

The formation of new branch APB's presupposes their organizational and administrative arrangement with a simultaneous transformation and coordination of ministries and departments that exercise control over production service for agriculture, transportation and processing of its products. At the present time the constituent branch blocks of the APK not only do not have a unified agency for comprehensive administration but they also lack economic levers for efficient utilization of labor and material resources. For example, in the Moldavian SSR the organization and administration of agricultural production are handled by several relatively independent republic ministries and departments: the Ministry of Agriculture, the Council of Kolkhozes, the Republic Moldplodoovoshehprom, Moldvinprom, Moldtabakprom, and other associations. The lack of a unified apparatus for exercising operational and comprehensive control on the basis of an overall approach to the development of all branches of the APK (except for the republic Gosplan) violates the unity of technical, economic and social ties within the framework of the complex and reduces the efficiency of the utilization of capital investments. In order to eliminate these and other shortcomings, it is expedient to change the functions of agricultural ministries and departments that are involved in processing agricultural raw material and to create a unified agency for control, regulation and coordination of the activity of all subdivisions that comprise the APK.

The main functions of such an agency could be: solving interbranch and interdepartmental problems; developing processes of interfarm cooperation and agro-industrial integration; providing for an efficient structure and maintaining the proportions among spheres and branches of the entire complex; conducting a unified technical and economic policy within it; developing direct ties within and among its blocks and improving cost accounting [khozraschet] relations; and creating more effective stimuli for orienting all of its units toward the achievement of the final results of the APK. The organization of the administration of production within the framework of the APK through branch agro-industrial blocks in combination with the departmental system of administration leads to the development of direct ties among blocks and within their production associations. This creates prerequisites for further deepening specialization and raising the level of concentration of production on the basis of strengthening interbranch ties. On the whole the organizational-departmental structure of administration is called upon to contribute to the formation of a system of production associations on various levels and to transform them into branch APB's with actual accounting for the developing interbranch ties. Therefore the largest part of the organizational and departmental structure of the APK should be handled by specialized interbranch agro-industrial blocks. Accounting for interbranch ties in the structure of administration through branch APB's makes it possible to improve the structure of cooperation and agro-industrial integration. As branch blocks and the economic ties among them and their production subdivisions become stronger, it is expedient to adjust the organizational and departmental structure of the administration of the APK in such a way as to move the center of gravity in administration of the complex toward the system of specialized branch agro-industrial blocks. This will also be promoted by the strengthening of direct cooperation among blocks and among their production subdivisions. In order to form an efficient structure of production associations and branch agro-industrial blocks and to develop scientific and technical progress in order to improve the final results, the administrative agency of the APK must have not only administrative and certain organizational and economic functions, but also the corresponding system of economic incentive funds.

The general principle for the creation of such a system can be the coordination of the distribution and utilization of part of the net income which in the framework of branch blocks and their subdivisions,in keeping with their actual contribution to the final results to the complex. For example, the system of economic funds within the framework of the block should maximally stimulate the subdivisions of the first sphere of the APK to produce such material-substantial means as would increase the productivity of agricultural crops, improve the quality of their storage and processing, and increase labor productivity in agriculture and processing branches; the second sphere--to increase the productivity of agricultural crops and the productivity of animal husbandry; and the third sphere--to improve the quality of processing and storage of products. In this stage the ministries and departments, enterprises and associations that comprise the organizational-departmental agency of the APK retain their independence and responsibility within the framework of the sphere of their activity. Being units of a single comprehensive regional system, the ministries and departments can more concretely resolve branch technical-economic, organizational and economic problems, taking into account the interests of both the branch and the APK as a whole, subordinating departmental interests to final results.

In practice the development and transformation of the system of production associations into a new structural unit of the regional APK and the organizational-economic formation of the latter can create production and economic prerequisites for comprehensive, proportional transformation of the main aspects of production in interconnected branches of agriculture and industry, conducting a unified economic and technical policy, and solving interbranch and interfarm problems on the basis of the creation of a unified organizational-economic and program-target planning and economic system and, finally, prerequisites for more clear-cut determination of the economic and functional tasks of the constituent parts of the complex. A structurally integrated APK would open up more favorable possibilities of further development of interfarm cooperation and agro-industrial integration. As practice shows, the solution to problems related to these processes are directly dependent on how comprehensively changes are made in the conditions for production in agriculture and in all of the branches of the national economy that are related to it.

The establishment and development of agro-industrial blocks and the organizational-economic formation of APK's create conditions for better ensurance of proportionality among the industrial changes in various aspects of the unified technological process of agro-industrial production: production service for agriculture, agricultural production itself, transportation, storage, processing, and sales of agro-industrial products; a comprhensive approach to introducing various aspects of scientific and technical progress, the creation of an industrial feed base, the development of services and cultural and domestic conditions in rural areas, the expansion of the transportation and road system, and so forth. Within the framework of the APB favorable conditions are provided for observing proportional changes in the rates and forms of the development of agro-industrial cooperation and the transformation of the material-technical and social base of all participants in joint production.

The establishment of new economic branch blocks and their transformation into structural subdivisions of regional APK's should take place in several stages in keeping with the level of industrialization of agriculture, the transformation of the production bases of the kolkhozes and sovkhozes, and the degree to which rural social problems are solved. In our opinion, it is possible to single out the following stages. First--a change in the multibranch structure of the kolkhozes and sovkhozes and, on the basis of farms in the region, the creation of territorial-production associations within whose framework intrafarm and interfarm specialization of enterprises is carried out. Second--the transformation of territorial-production associations into a system of specialized branch associations within whose framework, in the final analysis, the economic independence of individual enterprises is forfeited. On the basis of the development of specialization of enterprises according to the branch principle special cost accounting [khozraschet] production associations can be formed. Third--the unification of production associations with scientific subdivisions and the creation of scientific-production associations. Fourth--the unification of agricultural and industrial productions and the creation of agro-industrial scientific-production associations. Fifth--the transformation of the system of scientific production associations into branch agro-industrial blocks of the regional APK. Sixth--the transformation of the functions of agricultural ministries and departments involved with industrialization of production service, production for processing agricultural raw material itself, and the development of structurally integrated national economic and local APK's. Naturally, these stages can be interwoven in time. Extensive development of the system of branch agro-industrial blocks and their transformation into structural units of the regional APK is the same as creating a structurally integrated national economic agro-industrial complex, the process of whose formation was successfully carried out under the Tenth Five-Year Plan and will undoubtedly continue and develop on a better basis under the Eleventh Five-Year Plan which has just begun.

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RELIABILITY OF PRICING FOR AGRICULTURAL EQUIPMENT UNDER QUESTION

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 3, Mar 81 pp 40-42

[Article by Z. Gerasimova, candidate of economic sciences and head of a sector at the All-Union Scientific Research Institute of Agricultural Economics: "On the Prices for Agricultural Equipment"]

[Text] In recent years a trend has been observed in agriculture towards excessive growth in production expenditures compared to the increase in output volumes. Thus, whereas the gross output of kolkhozes and sovkhozes in 1978 increased (in comparable 1973 prices) by 29 billion rubles compared to 1966, the production expenses for this output increased by 50 billion rubles. Moreover, the proportion of amortization in production costs, for the acquisition of agricultural equipment and other resources used in production, increased considerably.

In the opinion of a number of economists, such a situation is explained to a considerable degree by the unwarranted inflated prices for the industrial products being supplied to agriculture. This thought is usually borne out by the fact of growth in the average wholesale prices for the mentioned products and the specific prices per unit of the principal parameter (power) for the principal types of agricultural equipment.

However, the trend towards growth in the average wholesale prices for agricultural machines and equipment (just as for other items of industrial output) cannot by itself testify to insufficient economic validity for the prices for these products, since the creation of new, more productive, better quality and, it follows, more technically complicated machines, is as a rule accompanied by raised expenditures for their production. Absolute growth in the prices for new and more improved machines, compared to those replaced, is a normal phenomenon from both a technical and practical standpoint.

The criterion for the economic validity of prices for new equipment is a reduction in such prices per unit of useful effect obtained from the use of the equipment, since the basic principle for price formation for improved quality equipment is its relative reduction in price.

An extensively employed indicator for relative price reduction (increase in price) for new equipment -- is the specific price per unit of productivity (power) for this equipment. In a number of machine building branches (including agriculture), an increase takes place in this indicator and this forces the conclusion that the prices for equipment are rising more rapidly than the increases taking place in its quality indicators. However, the growth in prices for domestic machines, per unit of their productivity, is conditioned to a definite degree by the fact that equipment improvements are not limited to merely increasing its individual power capability, but rather it also includes improvements in other quality parameters.

Thus the existing methodology for price formation for new machines and equipment takes into account the influence generated by the two principal components of the useful effect, included in the structure of the limiting price:

...the proportion of the effect obtained from an increase in the productivity and durability of a machine;

...the proportion of the effect obtained from having reduced the current operating expenses of the consumer (wage savings, expenses for repairs, fuel and lubricating materials and so forth).

Thus the formula for a limiting price permits an increase in price for a unit of productivity (power) in new equipment, provided this increase in price is compensated by a savings in current expenditures for the consumer.

Our domestic industry has mastered the production of KKS-6 castor-oil plant harvesting combines as replacements for the obsolete KKS-4 machines. The wholesale price for the new combine has been approved -- 12,280 rubles for industry and 9,935 rubles for agriculture. The price for the KKS-4 was 9,000 and 7,650 rubles respectively. From the standpoint of productivity, the new combine differs very little from the machine it replaced (hourly operational productivity of the KKS-6 is 1.16 hectares per hour and for the KKS-4 -- 0.93 hectares per hour. Taking into account merely the growth in productivity of the new machine, a limiting price should be established for it on the order of 9,144 rubles for industry and 7,772 rubles for agriculture. Such a limiting price would ensure a relative reduction in price of 20 percent for the KKS-6 combine, per unit of productivity.

However, increased productivity is not the only virtue possessed by the new machine. First of all, its design makes it possible to reduce considerably (by more than twofold) the losses which occur during the harvesting of the castor-oil plant. According to computations, the annual economic savings realized from this amounts to approximately 17,000 rubles.

Secondly, an arrangement which was developed at the invention level has been introduced into the design for the new combine that makes it possible to raise by more than twofold the quality of the castor-oil plants being harvested. The annual economic effect to be realized by agriculture, taking into account the higher procurement price for the actual quality of the castor-oil plants turned over to the state, will amount to more than 2,000 rubles. It should also be added that the state realizes a considerable effect, which is impossible to show in a value form, from an improvement in the quality of such an important raw material as the castor-oil plant.

Taking into account the mentioned advantages of the new combine, its limiting price (for industry) is 31,000 rubles. This price represents an increase in cost for the new machine, per unit of its productivity, but this increase in cost is compensated by a reduction in losses and by an improvement in the quality of the castor-oil plants.

The grain harvesting combines were improved mainly by increasing their power capabilities -- from towed motor combines, which harvest only grain and which have a handling capability of 1.5-2 kilograms of grain bulk per second, to self-propelled machines which harvest the entire biological grain crop (grain, straw and chaff) and have a thrashing capability of up to 5-6 kilograms per second.

Great successes have been achieved in the sphere of automation of combine control. Formerly, the harvesting of the entire biological crop with the aid of a combine required the efforts of 5-6 individuals (tractor operator, combine operator, assistant combine operator and 2-3 individuals for the harvester-stacker). Today a self-propelled combine is serviced by only one individual.

Moreover, the improvements in specific models have either followed the path of automation of control (with the same productivity being retained) or the path of increased individual capability for a machine together with further automation of control. Thus, the mechanization of control for the S-4M self-propelled combine, which has a mechanized harvester-stacker, made it possible to reduce the number of service personnel required for the machine from five to two individuals. The productivity of the new machine remained the same as that for the towed combine -- 2.5 kilograms per second (A.P. Kolotushkina. "Price Formation and Technical Progress in Agricultural Machine Building," Moscow, MASHINOSTROYENIYE, 1976, pp 38-39).

Thus the expenses involved for improving the automation of combine control, as carried out in industry, were compensated for in agriculture in terms of the release of a definite number of workers. In view of the critical shortage of skilled machine operators, the indicated trend with regard to improvements in agricultural equipment should be viewed as being equally as important as raising the individual capabilities of the equipment.

Growth in the specific prices, per unit of the principal parameter -- productivity -- also promotes improvements in the sense of improved working conditions and safety measures for the machine operators, environmental protection and so forth.

In examining the problem of a relative reduction in price for new equipment, it should be borne in mind that a complete evaluation is required of the totality of the consumer properties of the equipment, in terms of the amount of economic effect to be realized from its production and use. In addition to determining the specific prices, per unit of the principal parameter, it will be necessary to calculate the change in the price of the new machine, compared to the one replaced, taking into account the total amount of useful effect. For this purpose, some economists propose the use of a coefficient for reducing the price level per unit of useful effect, equal to the ratio of the wholesale price to the upper limit of the price, which includes the entire effect realized from the use of the new machine.

An analysis of a relative reduction in price for new agricultural equipment has shown that when prices are approved for new models, such prices should be reduced per unit of useful effect. Thus, in 1976 the coefficient for a reduction in price amounted to an average of 0.68, in 1977 -- 0.67 and in 1978 -- 0.50 (on the whole, for all machine building output, the coefficient for a reduction in price in 1976 equalled 0.67). This data testifies to the increased computed effectiveness of the new agricultural equipment and its relative reduction in price.

Thus, based upon growth in specific prices per unit of productivity (power) for new machines and equipment, it is wrong to draw a simple conclusion regarding the unwarranted inflating of prices for them. If the growth in prices for agricultural equipment was the result of a systematic error in the price formation for the equipment, then this would bring about an overall increase in the level of profitability for this output, determined on the basis of its ratio to production cost. However, the statistical data does not confirm such growth. The profitability for new agricultural machines produced within the USSR Ministry of Agricultural Machine Building system, over a period of 1 year, amounted in 1973 to 3.8 percent, in 1974 -- to 4.2, in 1975 -- to 1.2, in 1976 -- to 3.9 and in 1977 -- to 1.5 percent of the production cost.

An erroneous conclusion regarding the degree of effectiveness of particular agricultural machines and the economic effectiveness of the prices for them can be drawn in those instances where their economic evaluation is based only upon the cost accounting effect realized by agriculture from the use of a particular machine, without taking into account its national economic effectiveness.

The MSK-1 single-row cabbage-harvesting machine, for the extensive harvesting of heart cabbage, will eliminate the need for manual labor. This machine passed its state tests on the fields of the specialized vegetable growing Bol'shevik Sovkhoz in Serpukhovskiy Rayon in Moscow Oblast. The annual production volume for mid-season to late cabbage at the sovkhoz is 40,000 tons.

A computation of the economic effect, according to data supplied by the sovkhoz, has shown that the use of the combine at the sovkhoz is ineffective, despite the fact that the introduction of combine harvesting of mid-season to late cabbage, on the entire area being used for this crop at the sovkhoz, will enable it to eliminate completely the use of man-power on the particular technological process and reduce the requirement for permanent workers by a factor of 3.

At the same time, a computation of the national economic effect has shown that the use of the particular machine is effective on the whole from the standpoint of the national economy. Actually, when computing the economic effect for agriculture, only that portion of the wages for workers from other branches was taken into account, since this portion was paid directly by the sovkhoz; the wages earned by them for their principal work were not taken into account.

In the case of an economic validation for the wholesale prices for new agricultural machines, the computed economic effect realized from their use is taken into account. Similar to any economic normative, the price assumes definite conditions for the use of the new equipment. If these conditions are not observed, then a disparity may develop between the actual effect realized and the computed effect. In other words, The complete realization of the computed effect embodied in the price for a new machine is possible only if the conditions for its operation coincide with those used for computing effectiveness. This is especially important in connection with the operation of complicated and costly equipment, the lack of use of which leads to a situation wherein the price for it turns out to be artificially inflated and, it follows, economically unprofitable for a farm which operates the given item of equipment.

It is considered wrong to use, as a criterion for the economic validity of prices for agricultural equipment, an indicator such as the ratio of the volumes of gross agricultural output to the cost (sum of prices) of the agricultural machines employed (A. Rubtsov. "For Determining the Prices for Agricultural Machines." MEKHANIZATSIYA I ELEKTRIFIKATSIYA SEL'SKOGO KHOZYAYSTVA [Mechanization and Electrification of Agriculture], 1980, No 7, p 5). The volume of finished agricultural output is the overall result of the work of the agricultural enterprises. It includes the matter of insufficient use of the potential embodied in the agricultural equipment, potential which was reflected in the cost for it. In addition, the chief effect realized from the introduction of machine equipment into agricultural production consists of reducing the periods required for carrying out the agricultural work, as a result of higher productivity in the new machines, reduced losses and live labor expenditures, the replacement of manual labor by machine labor, releasing man-power and, in the final analysis, lowering the production costs for the agricultural products.

In this regard, interest has been displayed in a proposal made by certain economists: when establishing the wholesale prices for new and better quality equipment, approval should simultaneously be obtained for an expenditure normative per unit of work carried out with its assistance, in conformity with the specific operating conditions (Ye. Sapilov. "Complex Approach for the Technical Re-Equipping of Production." VOPROSY EKONOMIKI [Economic Questions], 1980, No 8, p 27). This would make it possible not only to take into account the actual effect of the new equipment but also to control and stimulate improvements in its use.

Rather large reserves are available for further improving the system of price formation for industrial products being supplied to agriculture.

First of all, it will be necessary to raise the economic validity of the prices for the indicated output. In conformity with this, great urgency is attached to the problem of raising the trustworthiness of the computed effect, which includes solving two important problems: improving the formula for the limiting price and achieving a high degree of trustworthiness for the initial information used in computing it.

The value for the limiting price is dependent upon the amount of the computed economic effect for a new machine: the larger it is, the greater will be the degree to which the limiting price exceeds the limiting price for the machine being replaced and the possibilities for growth in the expenditures for the new machine increase.

We are of the opinion that the effective formulas for the limiting price fail to take into account the specifics of agricultural machine usage. The use of new equipment in agriculture does not lead to a savings in specific capital intensiveness (accordingly for amortization) in agricultural work, since the higher cost of this equipment is applied as a rule to the same volume of work carried out at a farm using machines of the given type.

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TILLING AND CROPPING TECHNOLOGY

STATE OF READINESS FOR SPRING SOWING IN BELORUSSIA

Moscow SEL'SKAYA GAZETA in Russian 25 Mar 81 p 1

/Article: "On the Readiness of the People's Kolkhozes and Sovkhozes for the Spring Sowing"/

/Text/ The BSSR Council of Ministers has heard the reports of the BSSR Minister of Agriculture, Comrade Sen'ko, and the Deputy Chairman of the BSSR Goskomsel'khoztekhnika /State Committee for Agricultural Equipment/, Comrade Ivanov, concerning the readiness of the republic's kolkhozes and sovkhozes for the spring sowing. It was noted that the BSSR Ministry of Agriculture, the BSSR Goskomsel'khoztekhnika, the oblispolkoms and rayispolkoms, as well as the farm directors and specialists, in carrying out the decree of the CPBe/Communist Party of Belorussia/ Central Committee and the BSSR Council of Ministers, entitled "On Additional Measures to Prepare and Carry Out Spring Field Operations in 1981," have implemented a number of organizational-economic and technical measures aimed at the on-schedule and high-quality preparation for conducting the spring sowing.

On the whole, the republic's kolkhozes and sovkhozes have been completely supplied with seeds for the spring grains, potatoes, flax, and sugar beets. On most of the farms and rayons the seeds for the spring grain crops have been brought to sowing conditions; there has been an increase in the proportion of high-reproduction seeds, and their assortment mix has been improved. The repairs on agricultural equipment have basically been completed. There has been an improvement in the quality of organic fertilizers, the plan for liming acidic soils is being fulfilled, the training and retraining of machine-operating personnel has been conducted in a well-organized manner, as has also the instruction of other workers in advanced techniques of cultivating agricultural crops.

Nevertheless, many kolkhozes, sovkhozes, and certain rayons of the republic have still not achieved a high state of readiness for the spring sowing, as required in order to ensure the fulfillment of the plans and the socialist pledges which were adopted for 1981 with respect to the production and procurement of agricultural products.

To this very day certain farms have not secured seeds for the spring grain and leguminous crops, flax, perennial grasses, and potatoes. At the same time the shipment into the republic of seeds, especially of leguminous crops, and their selection by farms from state resources are being carried out extremely slowly. As compared with last year, there has been a reduction of the quality of seed stocks, as well as in the proportion of seeds belonging to the first and second classes of the sowing standard.

Less organic fertilizers have been made than was the case last year. The plan readiness of energy-consuming equipment has not been met. In this matter insufficient aid has been rendered to the kolkhozes and sovkhozes by the repair enterprises of BSSR Goskomsel'khoztekhnika.

Up to the present time the BSSR Goskomsel'khoztekhnika and its local organs have not created at the supply bases and the technical exchange points the necessary reserves of assemblies, aggregates, and parts for tractors, motor vehicles, soil cultivators, and planting machines for the period of the spring sowing. Operations have been extremely poorly carried out with regard to furnishing tractors and farm machinery with attachments and apparatus for fitting out wide-cut aggregates and for combining technical operations. The required measures have not been adopted for increasing the readiness for operations during the sowing period of the motor-vehicle pool of the republic's kolkhozes and sovkhozes; on many farms because of unrepaired technical defects as much as half of the present trucks are standing idle. A great number of motor vehicles are not ready for operation in the Sel'khozkhamiya associations.

Kolkhozes and sovkhozes have not been furnished sufficient accumulations of the necessary quantities of fuel and lubrication materials; as of 16 March 1981, they had less of these materials than on this date last year. An acute shortage of diesel oils is being felt everywhere. Certain rayons and farms are being unevenly supplied with diesel fuel and gasoline.

Many kolkhozes and sovkhozes lack sufficient staffs of machinery operators, and the question of drawing them from other sectors of the national economy has still not been fully resolved.

The shortcomings noted in the present decree resulted from the fact that the BSSR Ministry of Agriculture, the BSSR Goskomsel'khoztekhnika, the BSSR Ministry of Procurement, the oblispolkoms and rayispolkoms, and the directors and specialists at many farms in their work to get ready for the spring sowing did not fully take into consideration the lessons drawn from results of past years, nor did they adopt all the necessary measures to ensure the complete and high-quality readiness of all kolkhozes and sovkhozes to conduct the spring field operations.

It is proposed that the BSSR Ministry of Agriculture, the BSSR Ministry of Fruit and Vegetable Farming, the BSSR Ministry of the Food Industry, the BSSR Ministry of Procurement, the BSSR Goskomsel'khoztekhnika, the BSSR State Committee for Supplying Petroleum Products, the Belsortsemovoshch republic association, oblispolkoms and rayispolkoms, as well as the directors of kolkhozes and sovkhozes take the following steps:

immediately examine the state of affairs with regard to the readiness for the spring sowing in every rayon, kolkhoz, and sovkhoz, and adopt urgent measures to eliminate the shortcomings which are discovered;

within the operating procedure resolve the problems of supplying each farm with the seeds which are short supply for the spring crops, and bring them up to high sowing conditions; speed up the shipping into the republic, distribution, and selection of seeds which have been allocated to the kolkhozes and sovkhozes from state resources; activate the work on supplementary acquisition within the republic's borders of seeds which are in short supply for leguminous crops; organize the disinfection treatment of seeds, as well as their heating by hot air, and the processing of seeds of leguminous crops, alfalfa, and clovers by rhizotorphine; establish constant monitoring over the condition of seed potatoes, carry out the sorting of strawberries, along with organizing the inter-farm and inter-rayon redistribution of potato seeds so as to ensure each farm with planting material.

It has been proposed that the BSSR Ministry of Agriculture, the BSSR Ministry of Procurement, and the oblispolkoms within a two-week time period report to the BSSR Council of Ministers on the work which has been accomplished with regard to this matter.

The following steps must be carried out:

within a 10-day period on all farms complete the repairs and qualitative preparation for work of tractors, farm machinery, and motor vehicles, conduct correlated check-ups and inspections of the readiness of equipment for field operations;

ensure the even shipment to kolkhozes, sovkhozes, and other agricultural enterprises, along with land-reclamation organizations, of fuel and lubricating materials and their efficient use for the purposes for which they were intended. Hold strictly responsible any persons guilty of releasing fuel allocated for the needs of agriculture to non-agricultural enterprises or organizations;

resolve without delay all problems connected with the additional recruitment into kolkhozes, sovkhozes, and other agricultural enterprises tractor and machine-operators, which are in short supply, from industrial, transport, and other enterprises, as well as from institutions and organizations. Complete the distribution among the various farms of the machine-operators recruited for the springtime field operations, and send them in good time to the kolkhozes and sovkhozes. Create the necessary conditions of work and daily life for them, and specify measures of moral and material incentives.

during the course of 10 days complete the recruitment of mechanized detachments and units in every kolkhoz and sovkhoz, bearing in mind the organization of their assembly-line-type group work in the spring sowing. Provide everywhere for round-the-clock technical servicing of soil-cultivating and sowing aggregates by means of mobile specialized brigades and units of Sel'khoztekhnika, as well as kolkhozes and sovkhozes, so that on each farm the sowing of all agricultural crops can be conducted within the best agrotechnical time periods;

conduct in good time a survey of the sowings of the winter grain crops, perennial grasses, hays and pasturage, carry out a complex of measures to care for them, including harrowing and supplementary feeding with nitrogen fertilizers. The finished plots of winter crops should be resown with spring grain crops. Taking into consideration the limited resources of solid nitrogen fertilizers, make extensive use of ammonia liquor /aqua ammonia/ and liquid organic ferlizers for the supplementary feeding of haylots and pastures.

in the days remaining before the spring field operations organize everywhere the highly productive use of technical and labor resources for the purpose of increasing the rate of carting out organic and mineral fertilizers and placing them under the spring crops.

The BSSR Ministry of Land Reclamation and Water Resources, the Glavpoles'yevodstroy, the BSSR Ministry of Agriculture, and their local organs, along with the kolkhozes and sovkhozes have to ensure the on-schedule drainage of surface waters from the sowing areas and the areas provided for sowing spring crops on reclaimed lands, as well as the high-quality preparation of water regulating and water-pressure facilities.

The Belorussian Civil Aviation Board and the BSSR State Committee for Supplying Petroleum Products should adopt additional measures to speed up the delivery of gasoline for agricultural aviation and also to ensure the on-schedule relocation of the airplane pool in order to fulfill the plans for aviation-chemical work during the time periods established.

The BSSR Ministry of Agriculture, the BSSR Ministry of Fruit and Vegetable Farming, the BSSR Ministry of the Food Industry, the BSSR Goskomsel'khoztekhnika, and their local organs, the obliskoms and rayispolkoms, as well as the directors of farms, must everywhere organize trial runs of the aggregates in the fields. During the first few days of field operations the machine-operators must ceremonially mark out the areas to be sown. Establish constant monitoring over the observance of the engineering requirements in preparing the soil and in sowing the agricultural crops; also organize the on-schedule examination of the work and its evaluation. Make daily summaries of the results of the socialist competition between farms, brigades, units, crews of soil-cultivator and sowing aggregates, and individual machine-operators; ensure the dissemination of progressive methods and devices for working in sowing.

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FORESTRY AND TIMBER

PULP AND PAPER INDUSTRY DEVELOPMENT PROBLEMS

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/Article by Doctor of Economic Sciences Professor V. S. Sominskiy, chief of a chair of the Leningrad Technological Institute of the Pulp and Paper Industry: "Ways of Developing the Pulp and Paper Industry"/

/Text/ The Barriers of Obsolete Habits

While having everything necessary to hold first place in the world in the production of paper and cardboard and to completely meet national economic needs, the pulp and paper industry is somewhere in the last ranks among the sectors of USSR industry, is not fulfilling the plan and is evoking the just reproaches of numerous consumers. Why? The shortest answer to this question is as follows. The underestimation of the importance of scientific and technical progress and the failure to utilize the numerous internal reserves of the increase of production are hindering the development of the sector.

In 1979 several large enterprises of the pulp and paper industry were shut down for many days: wood was not delivered. Such idle times are an unprecedented phenomenon, and they should be looked into, because the blame here belongs not only to rail transport and the hard winter. The roots go much deeper.

For many years logging in our country has been steadily increasing. In its amount the USSR holds first place in the world. For 1980 it is envisaged to increase the fellings by another 25 million m^3. At the same time over a long period the structure of the use of timber has changed very negligibly. Only a small portion of it (about 12 percent) is allocated for the needs of the pulp and paper industry, while the greater part is used for sawing or is consumed for mine struts in the form of uncut timber. In the past 20 years the proportion of the timber being used in chemical processing has increased nearly twofold, but this proportion is still one-fifth as great as in Finland and one-fourth as much as in the United States.

The increase of logging is by no means pleasing. And not because it adversely affects nature. Timber must be cut, otherwise it will become overmature and be lost. The question is, how much, where and what to cut. But the main thing is, how to use the felled timber.

Scientific and technical progress is making it possible to radically restructure the use of timber. Instead of wooden ties, for example, it is much better and cheaper to use reinforced concrete ties. Movable metal supports are effectively replacing mine props. Construction lumber, wooden floors and supports are becoming a thing of the past. A significant portion of the furniture is being made from plastics and their combinations with wood. It was proven long ago that wood packaging is a synonym of extreme backwardness. But timber keeps being hauled for sawing, and Gosplan is planning an increase of logging, stipulating for this the very resources, of which there are not enough for the development of the production of pulp and paper. A great force is inertia. The tradition of burning the waste of wood processing or throwing it into the dump instead of collecting it and turning it over to the paper industry workers is also explained by it, and not at all by common sense. Even at the leading associations of the furniture industry the proportion of the waste being sent to the paper industry workers for processing is no more than 8-10 percent. Meanwhile, half of the waste of sawmill operations would be enough for the implementation of the most optimistic plans of the development of the pulp and paper industry, and without the participation of the railroad, since such waste can and needs to be hauled by motor transport or the river fleet. Who should worry about this? Probably USSR Gosplan and USSR Gossnab, because the Ministry of the Timber and Wood Processing Industry, about which PRAVDA has written more than once, is processing less than half of what falls under the circular saw. But for the present the paper industry workers are being maintained on starvation rations, and they by no means have priority in deliveries of wood.

Another difficulty, which the sector is experiencing with raw materials, has been caused by a change in the structure of the wood being allocated for the production of paper pulp and wood pulp. The proportion of high quality coniferous wood, the so-called pulpwoods, has decreased. The proportion of technological firewoods, which were recently renamed pulpwoods of category 4, has increased. Wood chips, which are obtained from the waste of sawmill operations and wood working and from felling waste, have taken up more than one-fifth of all deliveries. Finally, more and more deciduous species: aspen, birch and poplar, have begun to be added to the total weight of coniferous timber. Increasing with each year, their proportion comes on the average to 13 percent.

The changes in the structure of the wood being processed have a number of objective causes. The most important of them is the depletion of the coniferous forests of the central and in part the northwestern regions due to improper, wasteful fellings. On the other hand, the aspiration to use the waste of mechanical wood processing (wood chips) and the aspiration to place into economic circulation the previously unused resources of deciduous timber have an effect.

The pulp and paper industry has taken a number of steps to change over the processing method. The proportion of the pulp obtained by the sulfate method, which makes it possible to process both low quality coniferous and any deciduous wood, including the wood chips from them, has increased appreciably. At one of the largest enterprises of the sector--the Syktyvkar Timber Industry Complex, at which the sulfate method is used--the proportion of wood chips in 1979 was nearly 42 percent (twofold greater than for the sector as a whole), pulpwoods--about 12 percent (two-ninths as much as for the sector as a whole), while the proportion of deciduous wood in the total volume of consumption was 43 percent (with an average for the sector of

13 percent). But the example of this complex is not at all typical. The changeover of the processing method in the sector has taken place more slowly than the changes in the deliveries of timber. And the large combines (for example, the Balakhna Combine near Gor'kiy) were stranded. Their processing method requires high quality wood, and it must be transported over thousands of kilometers.

In this connection the situation which has formed with thermomechanical wood pulp is significant. The technology of its production is attractive for the fact that it makes it possible to process the wood chips of mixed species and to obtain fiber with a yield of 93-96 percent, which is notable for quite high strength. By feeding the thermomechanical pulp into the furnish it is possible to obtain newsprint with the minimum addition of pulp and thereby to decrease its shortage sharply and to reduce substantially the total consumption of raw materials per ton of semimanufactures. The technology of obtaining thermomechanical pulp has been known for more than 15 years. Abroad they are producing millions of tons of it, but in the Ministry of the Pulp and Paper Industry they are still discussing whether or not this semimanufacture must be produced. They are more used to the old way.

Waste paper could give the paper industry workers much relief. Its collection is unquestionably inadequate and is only 18-20 percent of the amount of produced paper and cardboard, but this amount of collected waste paper is being used for the production of low quality cardboard and in a negligible proportion for the coarsest grades of paper. They cite the technological difficulties connected with the processing of waste paper. Meanwhile there are no problems, they have been invented. For example, scrap newspaper for many decades now has been used after processing for the production of newsprint. It is used for up to 90 percent of the total weight of the fibrous materials. The processed waste paper can be fed into the furnish of practical all papers and cardboards. This processing method was known long ago and has been used abroad since the early 20th century. In the GDR, in particular, the shortage of toilet paper and paper towels has been eliminated by means of waste paper.

Of course, certain economic conditions are necessary for the effective processing of waste paper. For example, in the USSR there are only 8 grades of waste paper, but there must be 35-40 grades (qualities). The price for waste paper is inordinately low, it should be brought closer to the price for pulp fiber. For course, it is pointless to design enormous plants for the processing of waste paper. Estimates and world practice show that enterprises with a capacity of 20,000-30,000 tons a year are the optimum, the maximum is 50,000 tons a year, since with a greater capacity the difficulties of collecting and delivering this secondary raw material increase. There is also an organizational problem. Who is to collect the waste paper? At present Soyuzvtorsyr'ye, which is under the jurisdiction of USSR Gossnab, does this. But Soyuzvtorsyr'ye also has other concerns which are connected with the interests of many sectors. But waste paper is needed in practice by only one sector--the pulp and paper sector. Thus, is it not better to make the Ministry of the Pulp and Paper Industry responsible for the collection, grading and processing of waste paper?

So it turns out that if the Balakhna Pulp and Paper Combine had been directed in due time toward the processing of the waste of sawmill operations, of which there is more than enough in Gor'kovskaya Oblast, and toward the production and use of thermomechanical pulp and the use of waste paper, it would not have to haul coniferous pulpwood from far away, complicating the operation of rail transport. Of course, everything that has been said pertains not only to the Balakhna Pulp and Paper Combine.

The Problem of Location

Let us imagine that a pulp and paper combine has been built in a dense forest, which stretches for hundreds of kilometers. It would seem that there is no problem in supplying wood. But there is. Because with the operation of the enterprise and its consumption of wood the logging moves farther and farther away. But who calculated and is calculating how much this "farther and farther" costs in the taiga forests, where each meter of distance must be negotiated with enormous efforts. Hence, it is necessary to think about a reasonable size of combines and to reject the long ago condemned, but very tenacious megalomania.

Why build giant plants in Siberia and the Far East, and near large hydroelectric power stations? Pulp and paper enterprises are able not to consume electric power at all from outside: they generate it themselves at powerful thermal electric power stations, since they use much process steam. They do not need much fuel, since they can meet a considerable portion of the need for it by burning the waste of the digestion of pulp. The main thing in the location of these enterprises is the proximity of wood and water.

In Siberia and the Far East, with allowance made for the difficulty of developing large forests and their species composition, enterprises of medium capacity are needed: one-half, one-third as large as the Bratsk and Ust'-Ilimsk combines and the Yeniseysk Combine, which is being planned. Commercial semimanufactures and mass types of paper and cardboard should be the main output of such enterprises. But production should be located not at the request of hydraulic engineers, but on the basis of the location of the transportation routes over which timber and the waste of sawmill operations will be brought in and finished products will be taken away.

It is necessary to think about the attachment of permanent timber raw material bases to operating combines and associations and ones being planned. This would give paper industry workers an opportunity for the regulation of their operation and the observance of reforestation. So far the decision on the attachment of timber raw material bases to enterprises of the pulp and paper industry, which was adopted many years ago, in practice is not being implemented. These enterprises receive wood last, after all other users who, in the opinion of Gosplan and Gossnab, are more important. By the way, the proportion of the deliveries of wood to paper industry workers from the so-called bases attached to them is 14-15 percent.

Intrasectorial Problems

First of all it is the reduction of the specific consumption of wood per ton of fibrous semimanufactures. This consumption in domestic industry is approximately 28-30 percent greater than in U.S. industry, and it is not at all a matter here of differences in the pattern of production of the semimanufactures or the quality of the wood. The composition of the wood (according to the proportion of pulpwood, wood chips, deciduous wood) in the United States on the average is the same as at our Syktyvkar Timber Industry Combine. It is also impossible to explain the cause of such significant differences in the specific consumption of wood by the peculiarities of the processing method. The cause lies in something else: in the regular deviations from the approved operating conditions, the low technological discipline, the enormous losses at all stages of production--from the arrival of the wood to the output of the finished semimanufacture. It is possible to attribute a portion of the losses to the imperfection of the equipment and a portion to the idle times due to the failure to deliver raw materials (after an idle period the losses always increase). But the main thing is still the disrespect of the processing method.

The practice of changes in the processing conditions without preliminary experimental checking has become established at pulp and paper enterprises. This happens because pilot plants which imitate and simulate the technological process do not exist at any enterprise, while the technical administration of the Ministry of the Pulp and Paper Industry is displaying complete indifference to their construction. In the sector there are several pilot plants which were built in connection with the need to check scientific developments. It is proposed to build a complex of pilot plants at the Syktyvkar Timber Industry Combine. All this is useful, but it is necessary to have pilot shops and works at every enterprise and every association. For the present the changes of the operating conditions, the composition of the chemicals and the designs of individual units are "tested" on large-tonnage heavy duty equipment, large losses are inevitable.

The recording of the consumption of wood, which is determined on the average for all production, is also extremely imperfect. As a result the specific consumption over several years remains ostensibly unchanged, although sharp changes occur in the composition of the raw materials and chemicals and in the equipment. The indicator of the production of pulp by digestion, which exists in the sector, is greatly aggravating the unreliability of recording. Pulp after digestion is a semimanufacture, a large portion of which is sent in a liquid stream to the next stage--the pouring of paper or cardboard, while a smaller portion is sent to the dryer for transfer to the user as commodity production. In establishing the assignment on the production of pulp by digestion, Gosplan confuses the enterprises and incites them to all kinds of wiles with allowance made for the consumption of wood. No one needs this indicator, its calculation is an internal matter of the enterprise, while the production volume must be measured according to the end results: paper, cardboard, items made from them and commercial pulp.

The changeover to the production of paper and cardboard with a lower weight per square meter is another intrasectorial problem. According to our estimates, the solution of this problem will increase the production of paper and cardboard by at least 10-15 percent with the corresponding saving of fibrous materials, chemicals and power. Let us cite just one example. The newsprint produced in the USSR has a weight equal to 50-51 g/m^2. Abroad such thick paper is no longer produced: the weight of a square meter of newsprint there is equal on the average to 47-48 g/m^2. In other words, it would be possible to increase the number of copies of newpapers by 5-7 percent, but even this is far from the limit. For several years now, while still on an experimental scale, Finnish paper industry workers have been producing newsprint with a weight of 25 g/m^2 on high-speed machines. Hundreds of thousands of tons of this paper have shown excellent printing qualities. But in our country they have not even attempted to conduct similar experiments: they are more accustomed to making thick paper.

PRAVDA has written that the changeover to paper and cardboard with a low weight per square meter requires a change of the system of recording the amount of work. Until the two measurers established by Gosplan 17 years ago--the tonnage and the length in meters--are next to each other and are equal, it is difficult to count on success. Meanwhile the entire output of paper and cardboard should be measured and planned only in meters, for precisely the area of this output, and not its weight, is important in consumption.

There is another reserve and another problem--the sharp increase of the proportion of coated papers and cardboard in the total production volume. Coating increases the printing qualities, enlarges the sphere of use and moreover is very profitable. Primarily kaolin is included in the pulp for coating. Its price (with allowance made for processing) is approximately one-fourth the price of paper pulp. By making the appropriate calculations it is easy to establish that a square meter of coated paper should cost 10-15 percent less than uncoated paper, while in terms of useful area 8-10 percent of the paper pulp will be saved. At present the proportion of coated paper is not more than 5-7 percent, the proportion of coated paper is even less, but it could be 20-25 percent. Not so much the assimilation of the technology of coating as the establishment of prices which stimulate the output of this product, as well as the provision of paper industry workers with the necessary chemicals and equipment are needed for this.

Thus, by utilizing the reserves of the reduction of the specific rates of consumption of wood, the decrease of the weight of a square meter of paper and cardboard and the increase of the proportion of coated papers and cardboards, it is possible to increase the production volume by 35-40 percent, without expending a single additional cubic meter of wood. Of course, assets will be needed for the purchase of new equipment and the modernization of operating equipment, for the construction of pilot plants and for the conducting of a number of studies. But these expenditures will be recovered in the shortest possible time.

You Will Not Go Far on an Imported Horse...

Modern pulp, paper and cardboard-making equipment, units and apparatus for the purification, filtering, evaporation and recovery of liquors and bleaching, finishing equipment and machines for preparing the wood are notable for considerable complexity and a high cost. With respect to the capital-output ratio the paper industry workers are even ahead of the chemical industry workers. A large paper-making machine in its dimensions, class of precision and complexity of the parts has few equals in industry. At any rate, a turbo-unit or a press weighing 10,000 tons is simpler. Until recently the pulp and paper industry was forced to use mainly imported equipment. Three-fourths of the paper-making machines and about 60 percent of the cardboard-making machines, and the largest ones, are imported. Continuous units for the digestion of pulp by the sulfate method, on which about 60 percent of all the sulfate pulp is now produced, were also purchased abroad. The use of imported equipment necessitates the expenditure of enormous amounts on repair and the production of spare parts. More than 30 percent of all the workers are employed in the repair service of the sector, but they are managing far from completely the maintenance of the equipment in working order and especially its modernization and renovation.

Considerable hopes were placed at one time in the placement into operation of two large machine building enterprises which were specialized with respect to the product assortment of the pulp and paper industry: the Petrozavodsk and Izhevsk plants. However, these hopes were not realized. Both enterprises engaged only in part in pulp and paper machine building. The orders of chemical industry and petrochemical industry workers make up a large portion of their output. It is possible to judge the technical level of what is being made for the paper industry workers from the model of a paper-making machine produced by the Izhevsk Plant, which is being assimilated at the Kondopoga Pulp and Paper Combine: its technical level conforms to the early 1960's. But this is the first and for the present the only domestic heavy-duty machine (114,000 tons/year). It took several years to produce it, they have been assimilating it since 1976, in 1980 the rated capacity was achieved, but the cost is still higher than the planned cost.

The Splendor of Possibilities and Modest Reality

The enlargement and improvement of the product assortment of the sector are of great importance for the increase of the efficiency and quality of its work. Here the main attention should be devoted to the interests of consumers. The product assortment of the domestic pulp and paper industry numbers at present about 800 items, while the world assortment numbers more than 6,000. Thus, the assortment of public health and personal items is still very narrow in the USSR, in the assortment of papers for printing there is no general-purpose coated paper which is suitable for all types of magazines and books, there is practically no thin and strong paper for encyclopedias and reference books, there are very few descriptions of papers for illustrations. The paper industry workers practically do not produce papers and cardboards with coatings made from polymeric materials, which are suitable for the packing of products, clothing, the parts of machines and machinery and various items for industry and personal use. Synthetic paper, the use of which is radically transforming the working conditions of many thousands of draftsmen and copiers, who are employed at design and cartographic organizations, has remarkable qualities: their labor productivity increases several times. The lack of bright inks (which are not being supplied by the Ministry of the Chemical Industry) is making the assortment of the pulp and paper industry very poor, which does not make it possible to properly design packets, boxes, bags and sacks, as well as notebooks and pads.

The enlargement of the product assortment in the pulp and paper industry is dictated not only by the needs of printing, trade, other sectors of industry and personal service. Fashion is also of great importance. Thus, in recent times wallpaper has been experiencing a rebirth. Modern technology makes it possible to produce tens of versions of it, while the achievements of design make it possible to print the most exquisite patterns on it. Unfortunately, our paper industry workers so far have nothing to boast about.

At least two conditions are necessary to constantly update the output and to enlarge the assortment: an adequate amount and a high quality of scientific and technical developments, including the experimental testing of their results, and the necessary reserve of capacities at operating enterprises. Neither exists in the sector.

Different Rates and Directions for Scientific and Technical Progress

The more thoroughly and extensively you analyze the state of the pulp and paper industry, the clearer the most important cause of its lag becomes: scientific and technical progress is not esteemed here, for the present it is not the basis of the increase of the efficiency and quality of work.

The updating of the output and the processing method can serve as an objective measurer of the rate of scientific and technical progress. In advanced sectors this value is on the average 8-10 percent a year, while in some narrow sectors it comes to 30-35 percent. In the pulp and paper industry the annual plan of the updating of the output and the processing method is about 1.2-1.3 percent.

The structure of the main directions of the scientific and technical development of the sector is also very unfortunate. A large portion of the assets and efforts (approximately 47 percent) are allocated for the development of new types of products and only 12 percent are allocated for the improvement and development of fundamentally new technology. However, since the new products are, as a rule, small-tonnage and have an extremely limited application, the rate of updating as a whole is very low. In all 25 percent of the assets go for the development of the software of the automated control systems. Here the decisions known long ago are being repeated in many ways. Basic research is virtually not being conducted in the sector. It accounts for no more than 3-4 percent of the expenditures. But in the pulp and paper industry of Japan, which holds second place in the world, the structure is completely different. The improvement of the items being produced and the processing method, as well as the assimilation of new raw materials and the use of waste products account for nearly 60 percent of all the expenditures, while software accounts for 0.73 percent.

At the sectorial institutes there are very few doctors of sciences: there are only nine, and for the most part they are not specialists in the area of production technology. The total number of those engaged in research and development (including wood chemistry) in the sector is approximately 2.3 percent of the industrial personnel engaged directly in production. In the advanced sectors of USSR industry this proportion ranges from 6 to 12 percent.

Of course, it is not the number of workers in itself that is important, but the results of their labor and the level of developments. The latter to a considerable extent is determined by the quality of the scientific equipment, the working conditions, the possibility and reliability of experimental verification. At the scientific research institutes of a number of foreign countries, where the pulp and paper industry is highly developed, the expenditures on development per scientist are three- to sixfold greater. It is hard to demand high results from the All-Union Scientific Production Association of the Pulp and Paper Industry, when it has less than 2 m^2 of area per staff member, the equipment is obsolete, while the so-called pilot base--the Krasnogorodskiy Plant--has 90 percent of its capacity engaged in the output of series-produced products which were assimilated long ago.

The pulp and paper industry, while producing one-fourth as much output (by value) as the chemical industry, spends on development one twenty-fifth as much capital. With respect to the cost the expenditures on science in this sector are about 0.7 percent, that is, they are the lowest for all the sectors of USSR industry. The technical administration of the Ministry of the Pulp and Paper is by no means complaining of a lack of capital. On the contrary, it opposes its increase.

The analysis of the successes and failures of the scientific research institutes of the sector is not a part of our task. But here are the facts: the number of themes being fulfilled in the Ministry of the Pulp and Paper Industry is one-seventh as many as in the Ministry of the Chemical Industry, their duration on the average is 14 percent longer, while the average cost of one theme is 2.6-fold greater, that is, the assets are scattered. The design organizations of the sector, as a rule, are not using in the designs of new enterprises the results of the latest domestic development, but rely on the processing method and equipment which have already been assimilated abroad, that is, by no means the latest word of science and technology.

Scientific and technical progress urgently dictates the need to solve a number of pressing problems. Among them are first of all the improvement of the existing processing method and the seeking of fundamentally new methods of it. Thus, when obtaining fibrous semimanufactures it is very important to find technically feasible and economically profitable methods of processing deciduous wood, the reserves of which in Siberia and the Far East are enormous, they constitute up to two-thirds of all the timber reserves. For the present this wood is not being used extensively for the pulp and paper industry, there are only experimental studies of its use, which are based on the research of scientists of the Forestry Engineering Academy imeni S. M. Kirov and the All-Union Scientific Production Association of the Pulp and Paper Industry.

At one time in Russia the obtaining of pulp from straw was assimilated for the first time in the world. Straw pulp was obtained with varying success up to the end of the 1940's, but then was halted due to the obvious unprofitability and the scarcity of raw materials. But since then much has changed in the potentials and means of the technology and processing method. According to the available data, pulp can be obtained from straw at small enterprises with the proper quality level and with acceptable economic indicators. With the development of agriculture, as well as the means of harvesting, baling and transportation, straw will become a less and less scarce raw material.

The two used methods of digesting pulp, the sulfite and sulfate methods, with their various modifications have been known now for many years. A search is being made for fundamentally new, more perfect processes which are capable of increasing the yield of the final product, preventing the contamination of waste water and reducing waste to a minimum. Oxygen-alkali digestion, the methods of which are being developed by scientists of the Leningrad Technological Institute of the Pulp and Paper Industry, the All-Union Scientific Production Association of the Pulp and Paper Industry and the Forestry Engineering Academy imeni S. M. Kirov, is one of these processes. But these developments are being carried out very slowly, since only 25-30 people, who, moreover, do not have a pilot base, are engaged in it. Hydrotropic digestion, the principles of which were developed by Professor V. S. Gromov of Riga in the late 1950's, has been undeservedly forgotten.

Bleaching plays a substantial role in increasing the quality level of fibrous semimanufactures, and although its technology is very far from perfection, very few measures are envisaged for changing the situation. The situation is no better with the technology of obtaining paper itself and cardboard. Its present level does not make it possible to produce paper which has an enormous demand--with a lower weight per square meter, coated, with coatings made from polymeric materials. The assimilation of such a processing method was postponed from the Ninth Five-Year Plan to the 10th Five-Year Plan, and now is being carried over to the 11th Five-Year Plan. The operations on obtaining paper from furnishes which combine pulp and synthetic fiber are being developed very slowly. The technological developments in the area of items made from paper and cardboard, especially public health and personal items, are being carried out altogether sparingly.

I. D. Kugushev, A. F. Kamenev and O. A. Terent'yev, scientists of the Leningrad Technological Institute of the Pulp and Paper Industry, have proven that at a certain stage of development the design principles of paper-making machines come into contradiction with the processing method. Thus, the further increase of the speeds and capacities comes up against the impossibility of ensuring the effective separation of the water from the fiber. The machines become inordinately expensive and bulky. Hence, the processing method must be changed radically, new solutions which are capable of opening the way for new principles of the designing of machines for making paper must be found.

People Determine the Fate of the Sector

It is impossible not to speak about the only comprehensive higher educational institution in the world, which trains personnel of all specialties for the pulp and paper industry--the Leningrad Technological Institute. About 200 candidates of sciences and 35 doctors of sciences: process engineers, engineers, power engineers, economists, mathematicians, physicists and chemists, teach at this higher educational institution. Original theories and proposals arise and new design and technological decisions emerge at the meeting point of the sciences. The scientific potential of the higher educational institution and the skill of its staff members are much higher than at all the sectorial institutes taken together. However, this potential is being poorly utilized. The Leningrad Technological Institute of the Pulp and Paper Industry does not have its own pilot plants, while the amount of work financed by the Ministry of the Pulp and Paper Industry and the Ministry of Chemical and Petroleum Machine Building is so small that about 40 percent of the scientists of the higher educational institution remain outside this work, confining themselves to theoretical and scientific methods research.

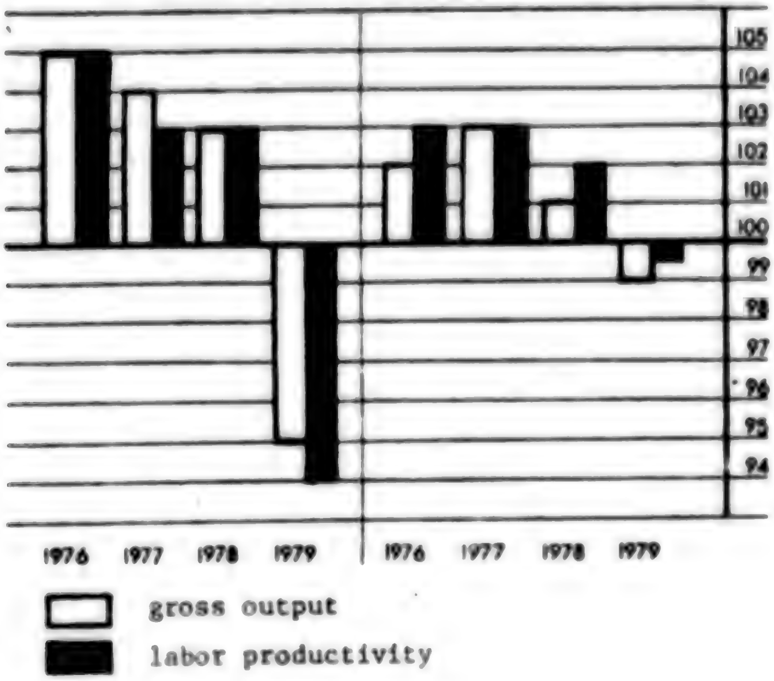
The combining by the leading scientists of work at the higher educational institution with work at sectorial institutes is not applied in practice, the higher educational institution does not have base chairs at large associations of the sector. And the most significant thing is that in the Ministry of the Pulp and Paper Industry and the Ministry of Chemical and Petroleum Machine Building they only occasionally enlist the scientists of the higher educational institution in the preparation of decisions which govern the development of the sector, and have a poor knowledge of what operations the collectives of the chairs are performing. Meanwhile the Leningrad Technological Institute of the Pulp and Paper Industry in creative cooperation with the All-Union Scientific Production Association of the Pulp and Paper Industry and the State Institute for the Planning of Enterprises of the Pulp, Paper and Hydrolysis Industry should occupy a leading place in the determination of the directions of the scientific and technical progress of the sector and in the solution of the most important complex problems which require the collaboration of scientists of many specialties.

It seems to us that many of the difficulties being experienced by the sector could disappear, if the principles, methods and practice of planning and supply linked the pulp and paper industry not with logging and wood processing, but with the chemical industry, toward which the processing method, the technology and the economy of obtaining paper, cardboard and pulp are gravitating. Until one department in Gosplan and the departments similar to it in Gossnab and the USSR State Committee for Science and Technology unite the timber, wood processing and pulp and paper industry and the construction materials industry, it is hardly possible to expect that the needs of the paper industry workers will be understood.

The pulp and paper industry should hold the place rightfully belonging to it among the advanced sectors of industry of the country, on which the acceleration of scientific and technical progress depends. But the shortage of its products must be eliminated forever.

Statistical Illustrations

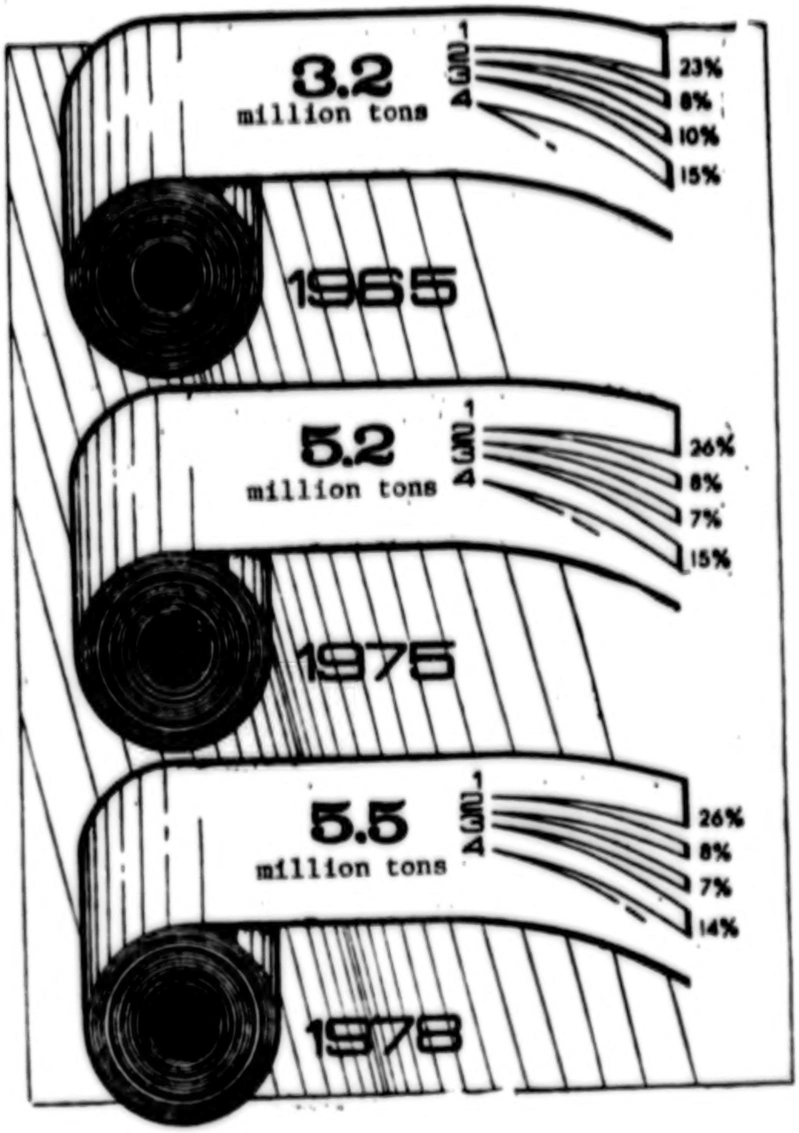
Growth Rate of Production of Gross Output and Labor Productivity, Percent of Preceding Year



Ministry of Pulp and Paper Industry

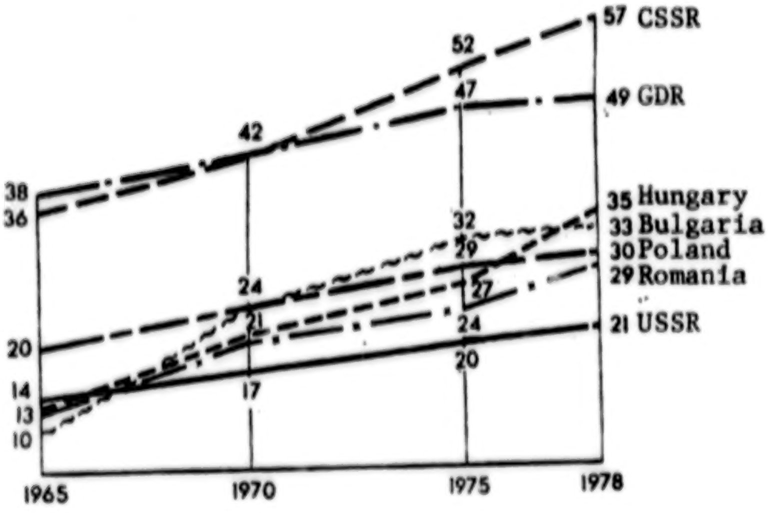
Ministry of Timber and Wood Processing Industry

Proportion of the Production of Individual Types of Paper in Its Total Production in the USSR, Percent of the Total

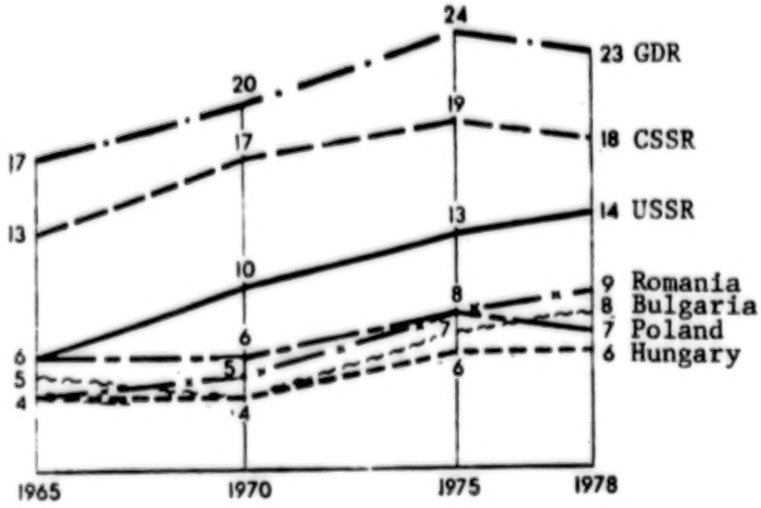


1--newsprint
2--printing paper
3--writing paper
4--wrapping paper

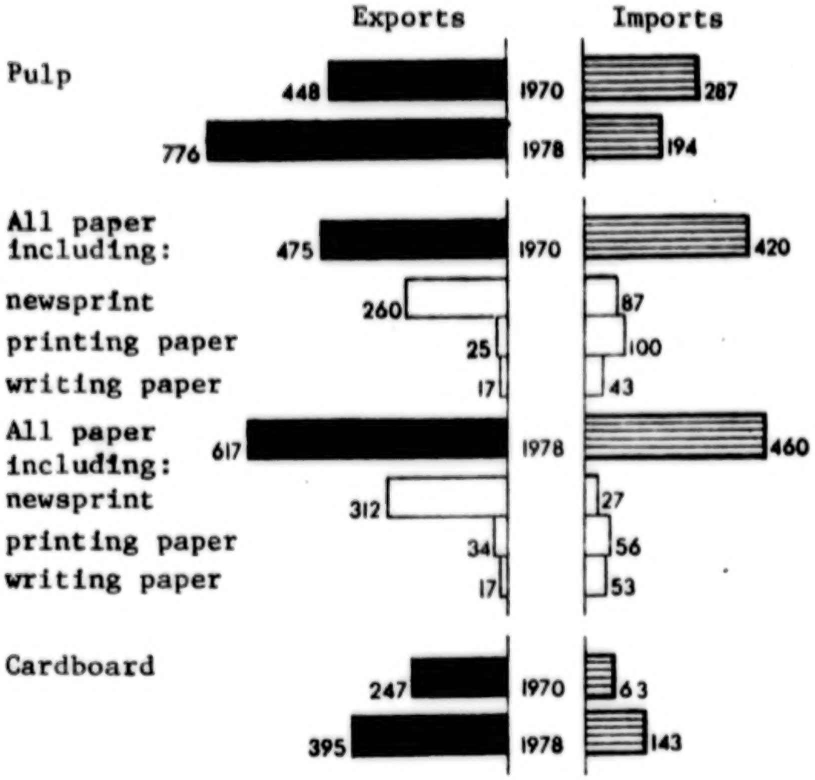
Per Capita Production of Paper by CEMA Member Countries
in 1965-1978, kg



Per Capita Production of Cardboard in CEMA Member Countries
in 1965-1978, kg



**Soviet Exports and Imports of Pulp, Paper and Cardboard,
thousands of tons**



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